



FREQUENTIS
FOR A SAFER WORLD

Achieving the Benefits of SWIM with “smart” SWIM applications

John Fort & Hannes Brunner, Frequentis

Air Traffic
Management

Agenda

SWIM Building Blocks

1

Integration Platform

2

Digital Briefing

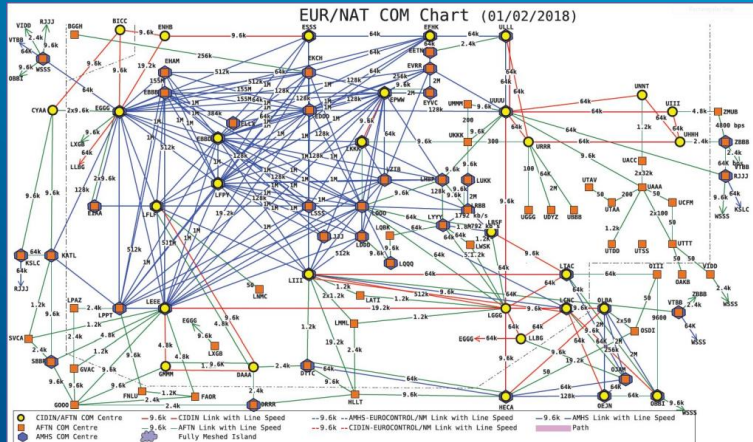
3

Conclusion

4

Frequentis ATM vision: A new paradigm of sharing ATM information

Based on commonly agreed and understood data standards and information models

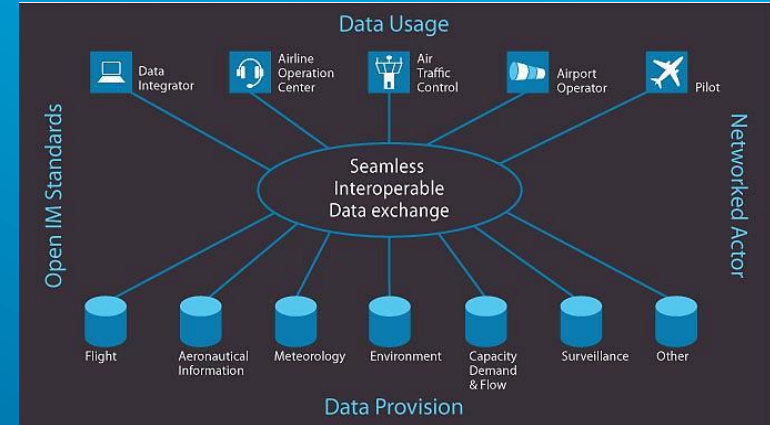


Data stored in silos

Duplicated

Inconsistently updated

Hard to access



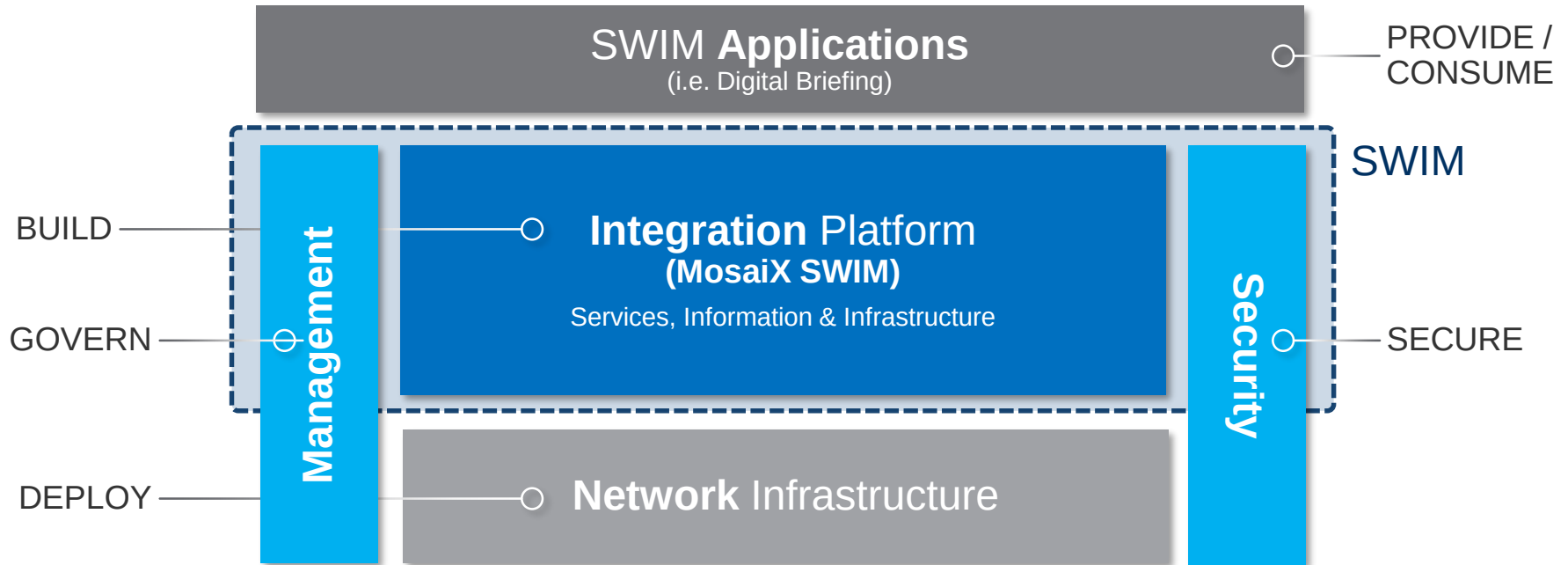
Shared

Net-centric

Synchronised

Quality-controlled

SWIM building blocks



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SWIM Building Blocks

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MosaiX SWIM Integration Platform

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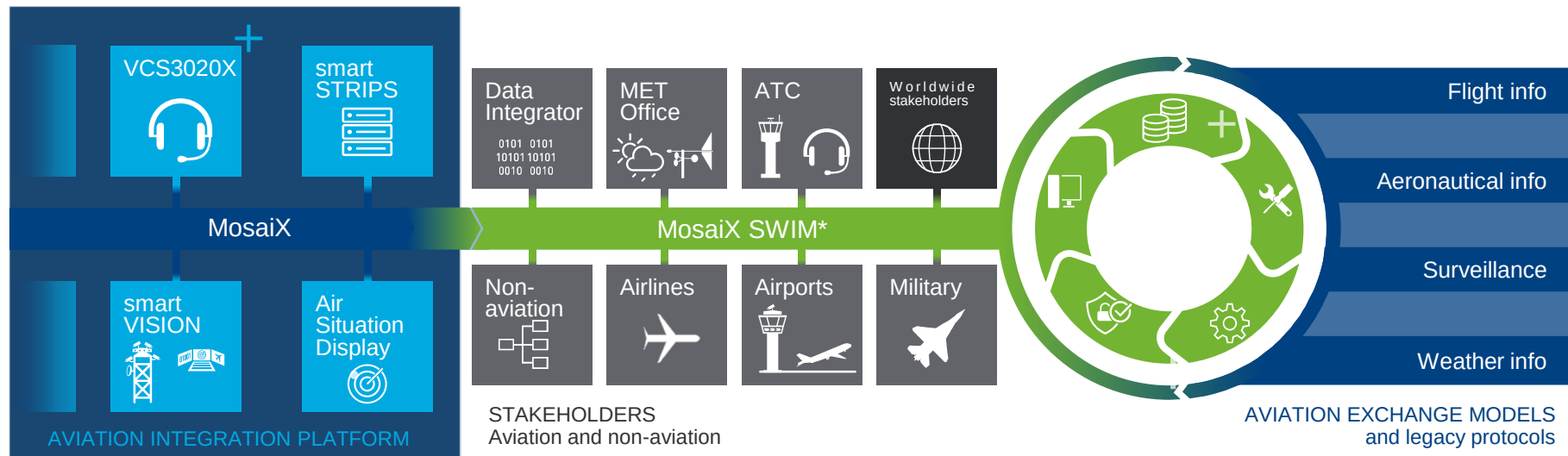
3

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Seamless, interoperable data exchange between all stakeholders

MosaiX SWIM information gateway

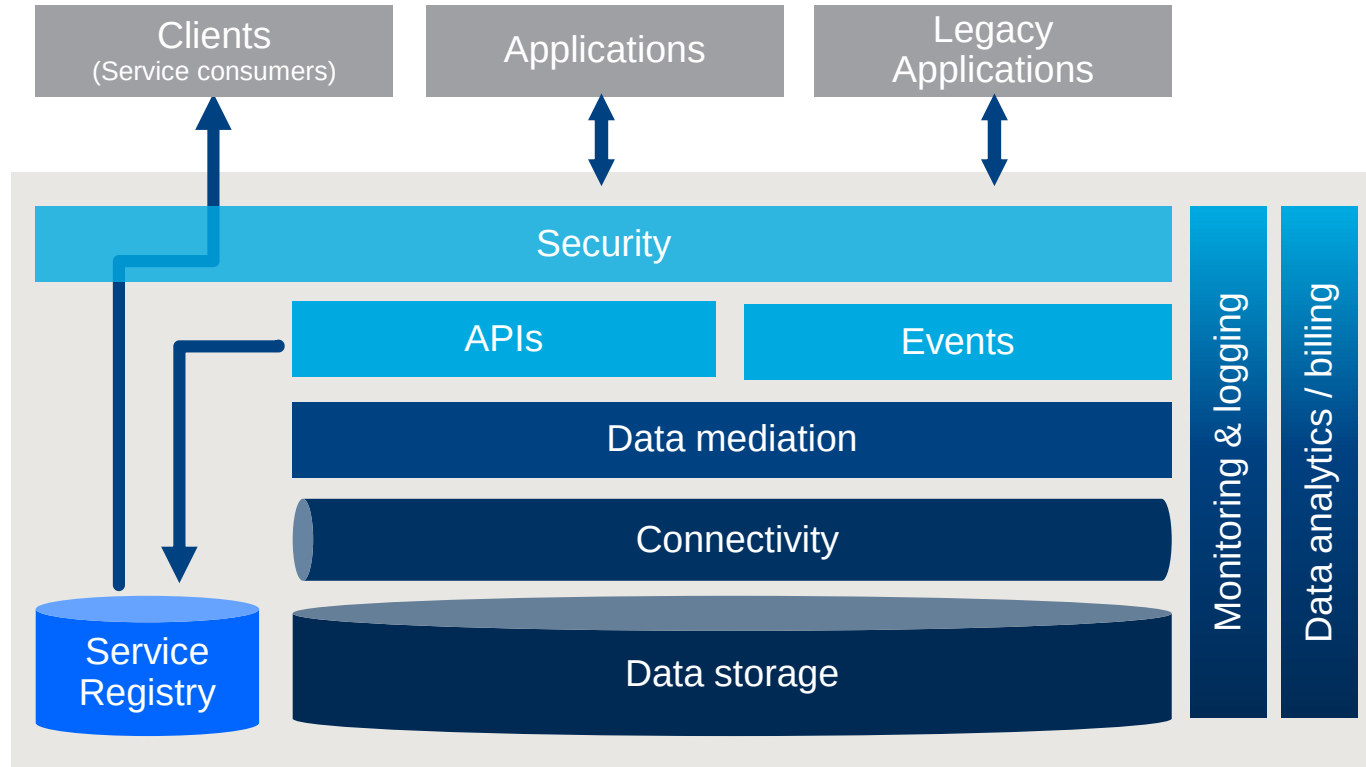


*) System-Wide Information Management

An end-to-end solution supporting all functions required

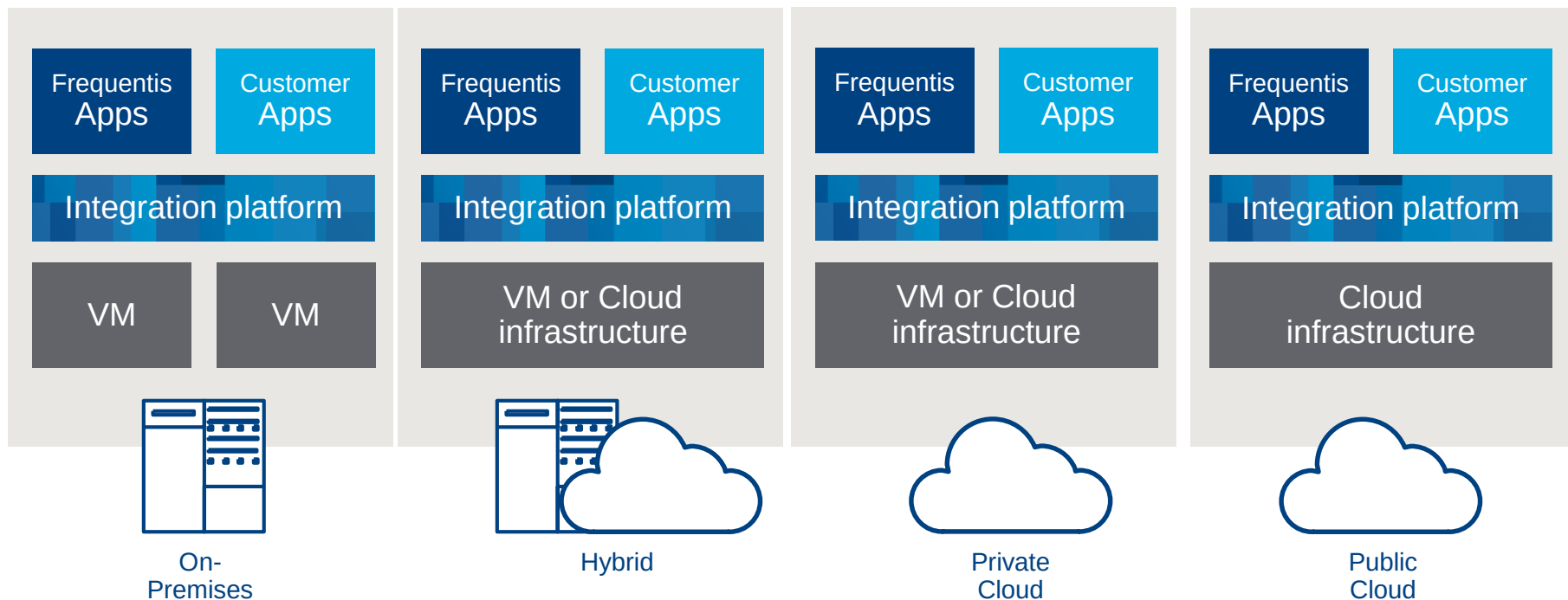
...from data acquisition to data consumption including billing and everything

MosaiX SWIM – Functional blocks



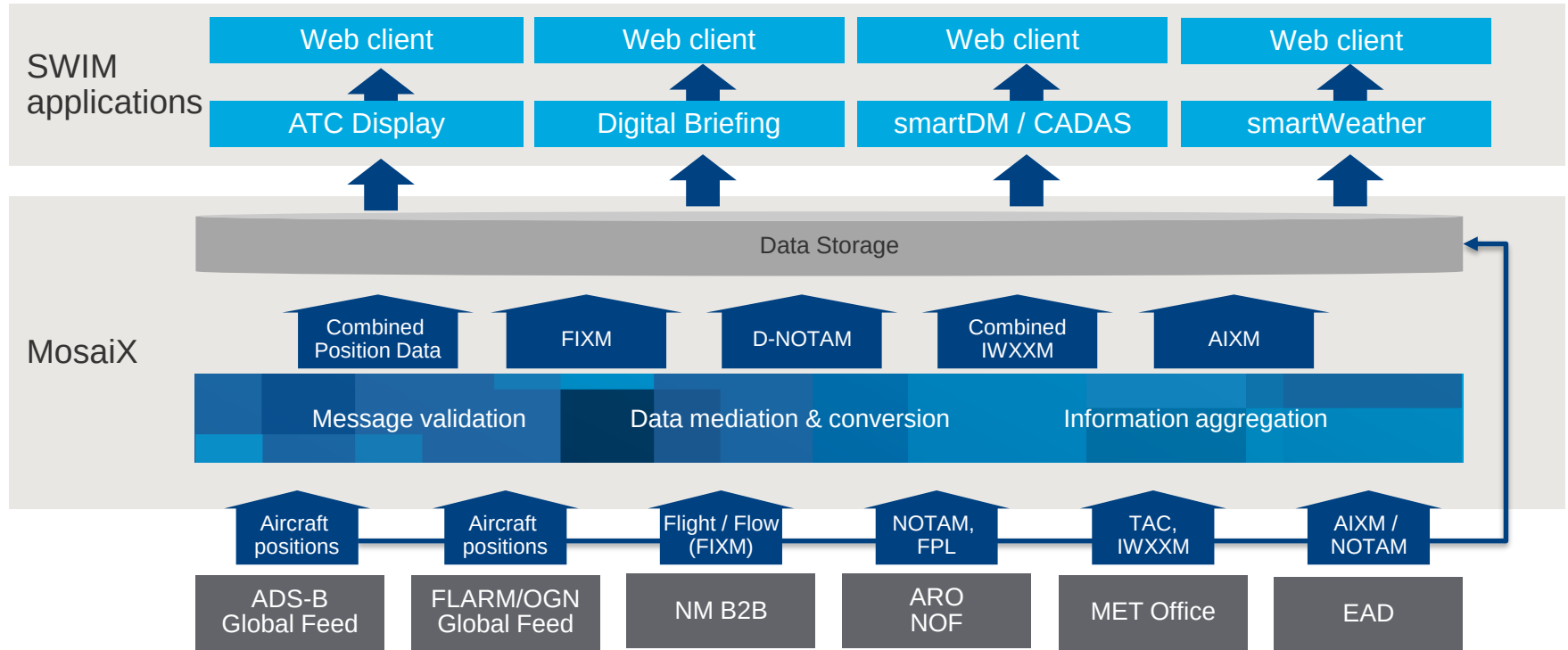
Flexible deployment options – including hybrid

MosaiX SWIM | Deployment options



Supporting acquisition / processing of all types of ATM data

MosaiX SWIM | Test and demonstration system



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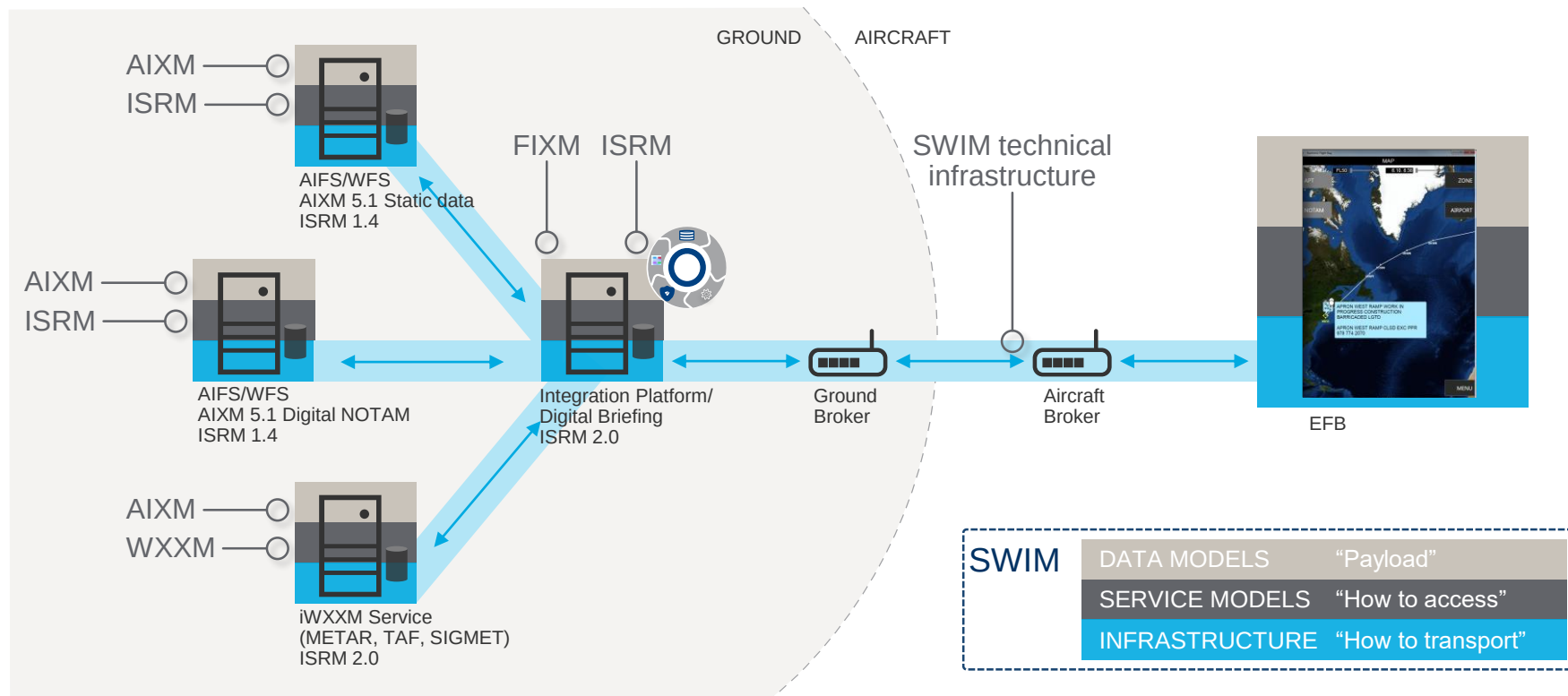
3

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Tested and validated within the SESAR research project

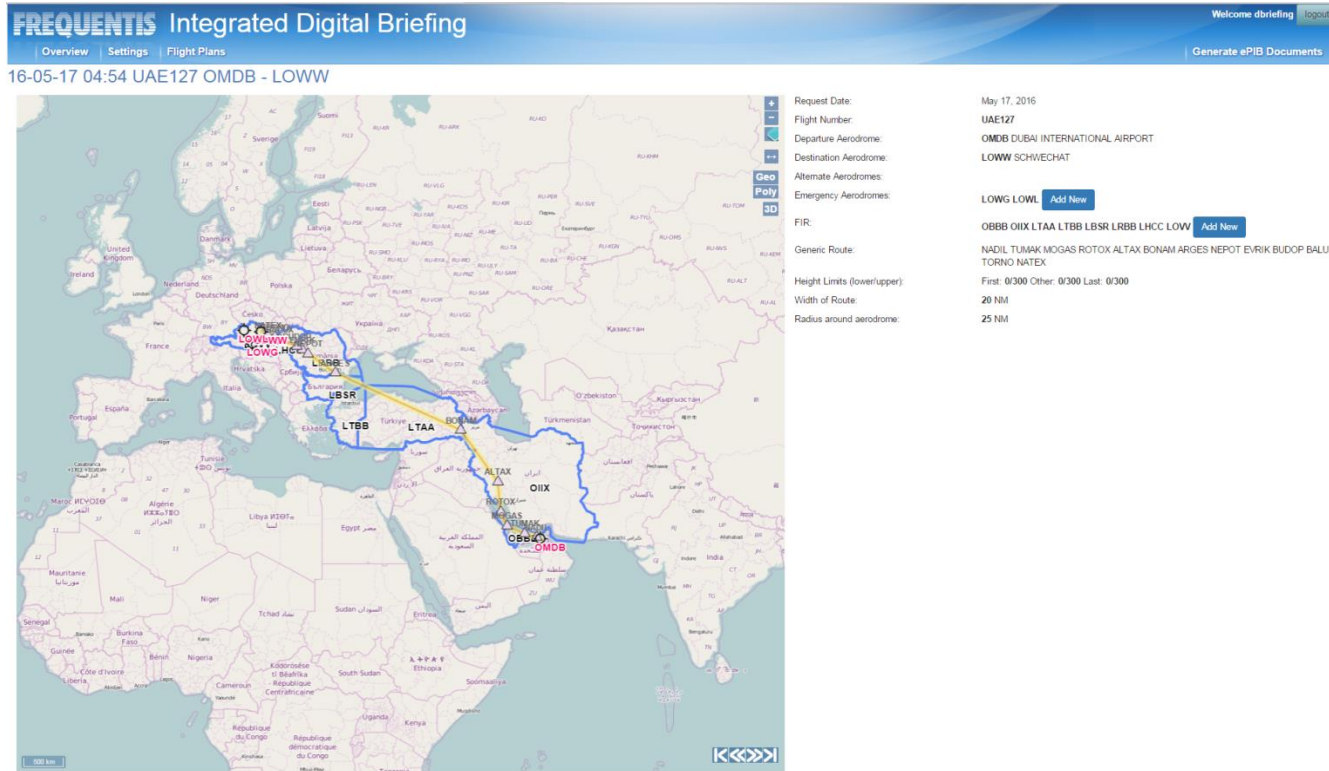
SESAR Project 13.2 | Digital Briefing validation scenario



Select Flight

FREQUENTIS Integrated Digital Briefing				
Settings Flight Plans				
Departure	Arrival	EOBT Date	EOBT Time	Flight Identification
KJFK	LOWW	2016-05-17	15:00	TEST01
KBOS	LOWW	2016-05-17	15:00	TEST02
KIAD	LOWW	2016-05-17	15:00	TEST03
KATL	LOWW	2016-05-17	15:00	TEST04
LOWG	LOWW	2016-05-17	15:00	TEST05
YSSY	OMDB	2016-05-17	15:00	TEST06
OMDB	LOWW	2016-05-17	15:00	TEST07
YSSY	OMDB	2016-05-17	11:10	UAE413
OMDB	LOWW	2016-05-17	04:54	UAE127

Flight Route



Airport View

FREQUENTIS Integrated Digital Briefing

Overview | Settings | Flight Plans

16-05-17 04:54 UAE127 OMDB - LOWW

Request Date:
Flight Number:
Departure Aerodrome:
Destination Aerodrome:
Alternate Aerodromes:
Emergency Aerodromes:
FIR:
Generic Route:
Height Limits (lower/upper):
Width of Route:
Radius around aerodrome:

May 17, 2016

UAE127

OMDB DUBAI INTERNATIONAL AIRPORT

LOWW SCHVECHAT

LOWW LOWL [Add New](#)

OBBS OIIX LTAA LTBB LBSR LRBB LHCC LOW [Add New](#)

NADIL TUMAK MOGAS ROTOX ALTAX BONAM ARGES NEPOT EVRIK BUDOP BALUX TORNO NATEX

First: 0/300 Other: 0/300 Last: 0/300

20 NM

25 NM

The map displays a flight route from OMDB (Dubai International Airport) to LOWW (Schwechat Airport). The route is shown as a yellow line starting from OMDB, passing through FIRs OBBS, OIIX, LTAA, LTBB, LBSR, LRBB, LHCC, and LOW, and ending at LOWW. A yellow circle highlights the LOWW area. The map shows major European cities and borders.

Airport Digital NOTAM

FRONTIER Integrated Digital Briefing

Overview Settings Flight Plans

16-05-17 04:54 UAE127 OMDB - LOWW

Overview APT TMA Meteo

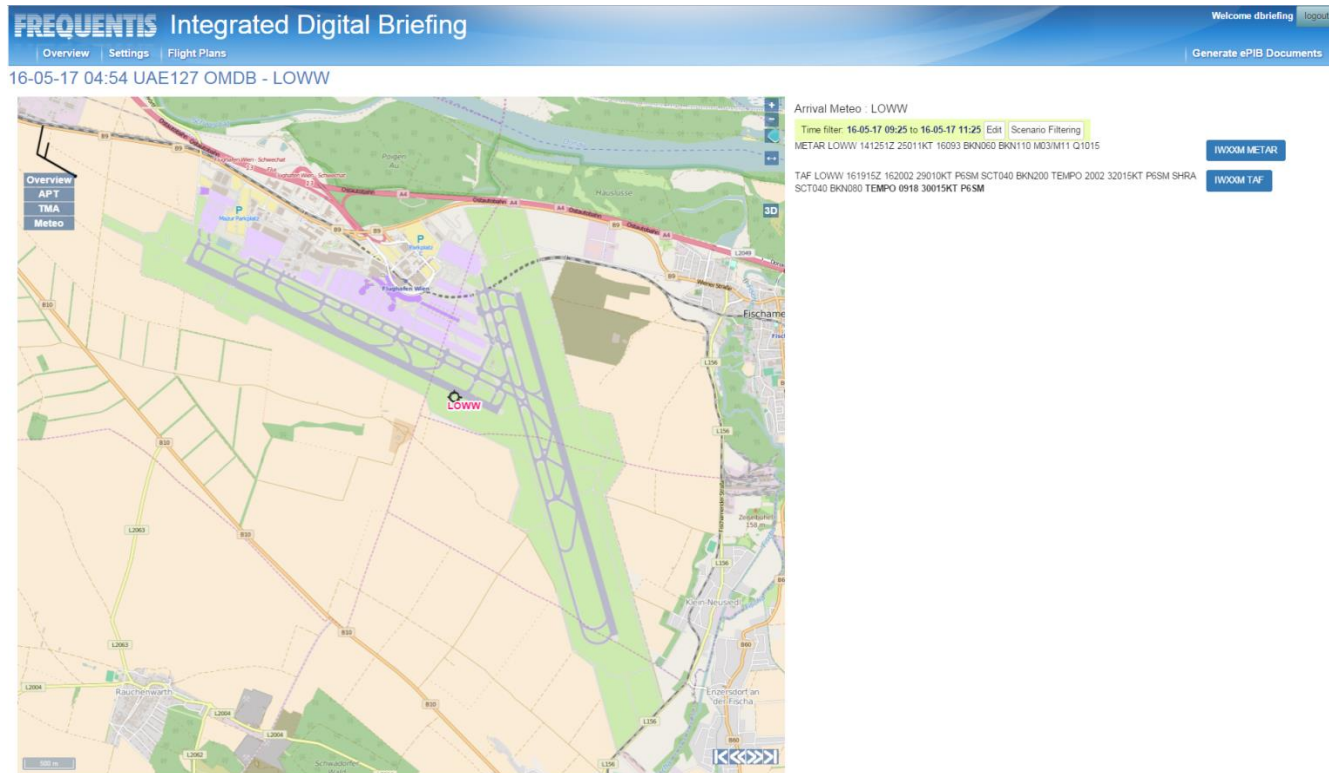
APR 16 04:54

Arrival Airport: LOWW

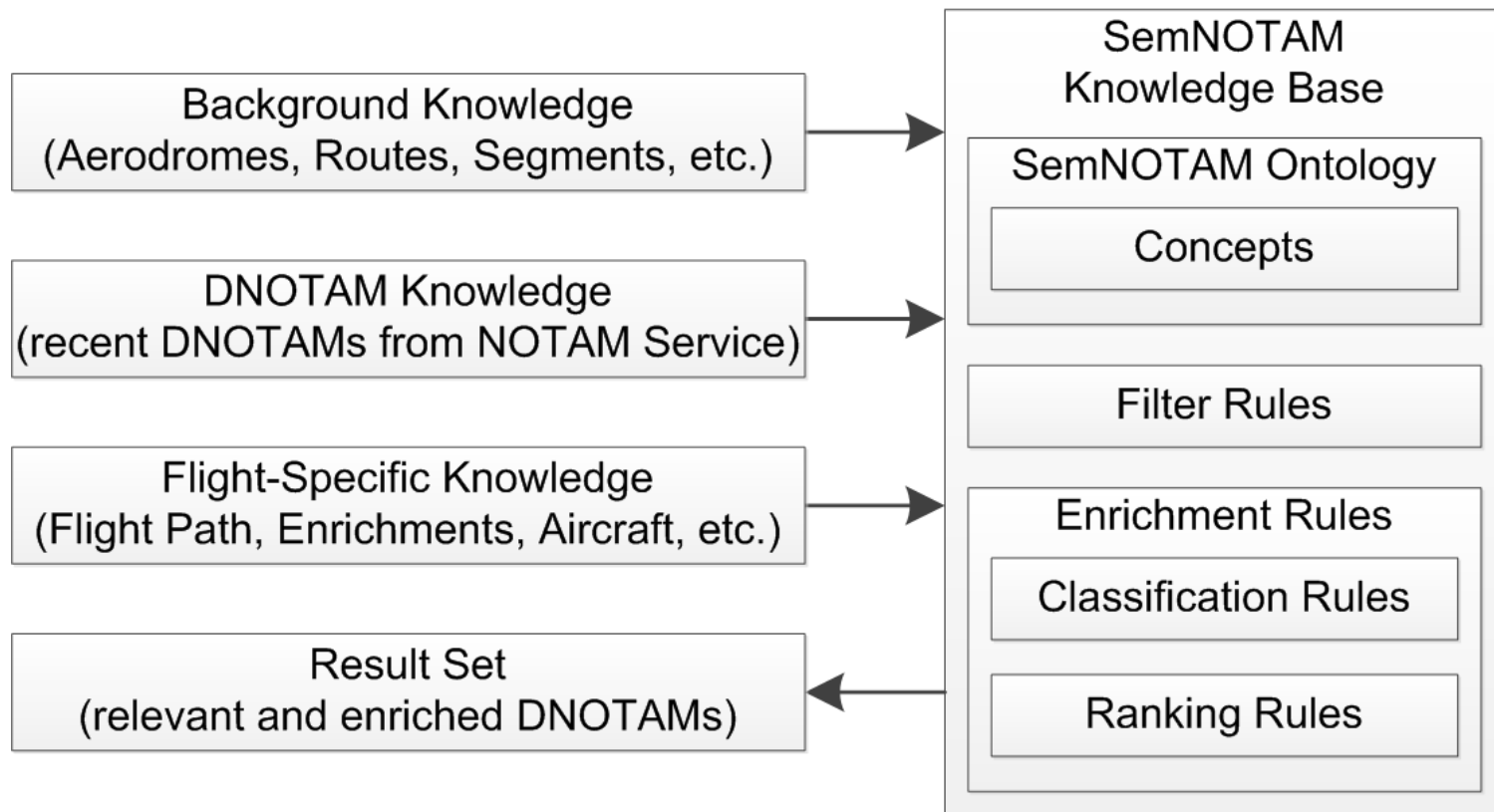
Time filter: 16-05-17 09:25 to 16-05-17 11:25 Edit Scenario Filtering

Flight	Time	Remarks
21 TWY Closure	16Apr19 14:00 to 16Jun01 14:00	A0294/16
TWY EX31 closed		
24 Displaced Threshold	15Dec10 00:00 to 16Jun01 23:00	A1546/15
RWY 16 THR displaced 300 M. New THR location 480705N 0163446E.		
WARNING: THR coordinates do not have the required resolution (1/100 seconds of arc)		
WARNING: Displaced THR coordinates are not co-linear with Runway centreline		
OTHER	15Dec29 08:37 to 16Jun01 23:00	A2651/14
Airport slot ID for general/business aviation flights to/from coordinated airports in Austria - see AIP page 015/23		
OTHER	15Nov17 17:04 to 16Jun01 23:00	A2381/14
Ref AIP Austria, LOWW ad 2.22, Item 2.2.3. Current rush hour periods in UTC are: 0600-0800, 0930-1030, 1330-1430, 1830-1745 and 1830-2030.		
27 OTHER	16Jan22 15:00 to 16Jun01 23:00	A2554/14
Surface movement radar north out of service.		
OTHER	15Oct14 13:55 to 16Jun01 23:00	A6291/14
Boeing 747-8 ops LOWW due to finalized compatibility project as a 5/09 not valid for b748. All published approach and departure procedures calculated for category d. For PAPI, meht and glide slope - check AIP LOWW ad 2.14 B748 MAY use all RWYs, TWYs and aircraft stand taxilanes which are useable unrestricted by icao code e aircraft. Pilots shall exercise caution when taxiing through TWYs a11, a12 and exit 1 as main gear to pavement edge clearance MAY be limited.		
Oversteering technique is required. TWY lima between exit 6 and exit 13 is an aircraft stand taxilane for b748. Rescue and fire fighting CAT 9 available. CAT 10 on request via etc 15 minutes in advance. Taxiing on TWYs and aircraft stand taxilanes during night and low visibility only permitted if center line lights are visible. Otherwise marshaller assistance mandatory. Ref AIP Austria LOWW ad 2.24-1-2: Max wingspans on parking stands not valid for b748 - mnm clearance to objects 7.5M		
29 OTHER	15Sep09 14:56 to 99Dec31 00:00	A1882/14
Intermediate holding position lima 3 established on TWY lima between exit 6 and exit 7.		
OTHER	15Oct14 13:24 to 16Jun01 23:00	A1216/14
Intermediate holding position lima 3 established on TWY lima between exit 6 and exit 7		
OTHER	16Jan11 08:22 to 16Jun01 23:00	A0045/14
Deicing procedure for act on main-apron and gac-apron: p r o c e d u r e 1. Report the necessity for deicing apse either to your ramp-agent or contact directly your contracted deicing agent. ACFT without contracted deicing agent MAY contact Vienna Ice on 131.625 MHz or telephone +431700722050. 2. Report necessity for deicing to ATC when ACFT is completely ready (doors closed, ready for start-up/push-back). 3. Areas: de-icing standby area: prkg pns e48 to e99. De-icing south: prkg pns e42, e43, e44, e45, e46, e47, e48, e49, e50, e51, e52, e53, e54, e55, e56, e57, e58, e59, e60, e61, e62, e63, e64, e65, e66, e67, e68, e69, e70, e71, e72, e73, e74, e75, e76, e77, e78, e79, e80, e81, e82, e83, e84, e85, e86, e87, e88, e89, e90, e91, e92, e93, e94, e95, e96, e97, e98, e99. 4. ACFT cleared to the deicing standby area approach prkg pns e48 to e99 from the south - marshaller guidance on the area is mandatory. If instructed by marshaller to stop on the deicing standby area, do not cut engines - intermediate stop only. Thereafter marshaller guidance to deicing south is provided and mandatory. 5. ACFT cleared to deicing north via blue or orange line expect marshaller on the area. ACFT cleared via TL40 expect marshaller at HP W1, W2, or W3. 6. Marshaller instructions are issued via display on follow me car or by hand signals.		
OTHER	15Oct14 13:55 to 99Dec31 00:00	A2127/14
Ref AIP Austria, LOWW ad 2.24-1-2, Remarks: the 4th remark shall read: pilots of long-wheelbase ACFT such as B777-300 and A340-600 shall exercise caution when taxiing through TWYs A11, A12 and exit 1 as main gear to pavement edge clearance may be limited. For those ACFT oversteering technique is required.		

Airport MET



- Intelligent and fine-grained DNOTAM filtering is not enough
 - PIBs still contain substantial number of DNOTAMs that are relevant for a specific flight
 - Missing organization capabilities of relevant DNOTAMs
- Ontology-based Representation and Semantic Querying of Digital Notices to Airman (NOTAM)
 - semNOTAM is a service not an application
 - Enable fine-grained intelligent semantic filtering and prioritization
 - Utilizing advantages of AIXM 5.1
- Knowledge-based system
 - Separating data and rules from reasoning
 - Incremental rule base
 - Based on pilot experience and feedback



FREQUENTIS Integrated Digital Briefing

Overview Settings Flight Plans 16-05-10 15:00 TEST02 KBOS - LOWW

Welcome d briefing Logout Generate ePIB Documents

Flight Brief Info

Map Controls

View Controls

Highlighted Feature

Flight Phase Browser

Semantic Annotations Switch

Departure Airport: KBOS

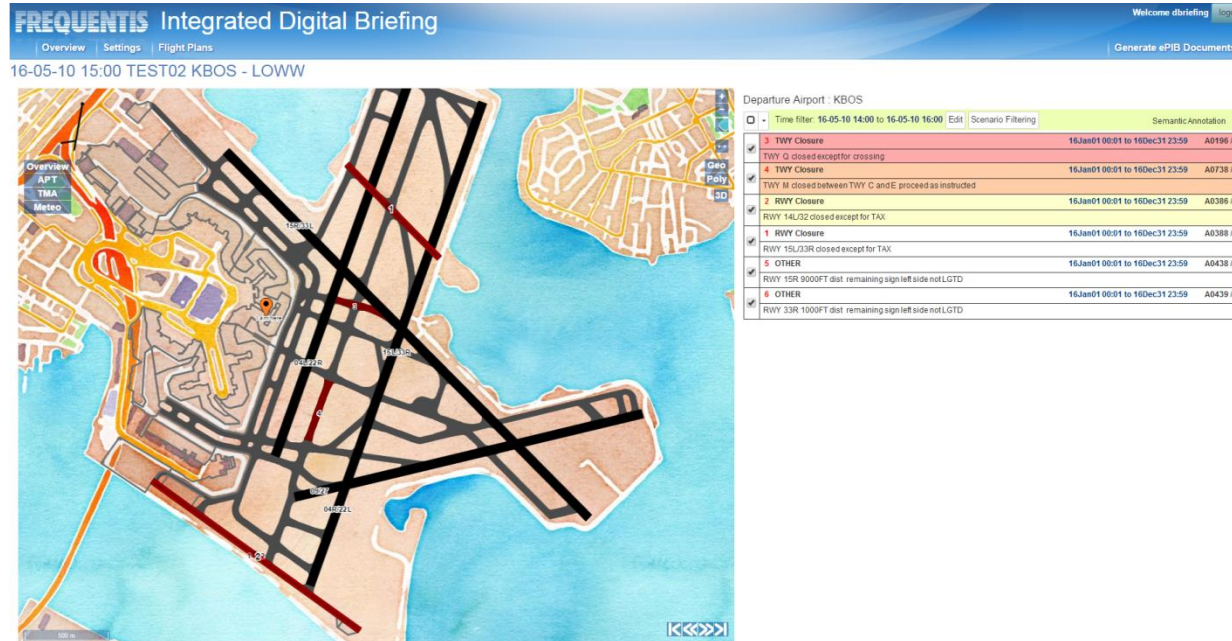
Time filter: 16-05-10 14:00 to 16-05-10 16:00 Edit Scenario Filtering Semantic Annotations

1	RWY Closure	16Jan01 00:01 to 16Dec31 23:59	A0388 / 15
2	RWY 15L/33R closed except for TAXI	16Jan01 00:01 to 16Dec31 23:59	A0388 / 15
3	RWY 14L/32 closed except for TAXI	16Jan01 00:01 to 16Dec31 23:59	A0196 / 15
4	TWY Closure	16Jan01 00:01 to 16Dec31 23:59	A0738 / 15
5	TWY Q closed except for crossing	16Jan01 00:01 to 16Dec31 23:59	A0438 / 15
6	TWY M closed between TWY C and E, proceed as instructed	16Jan01 00:01 to 16Dec31 23:59	A0439 / 15
7	OTHER	16Jan01 00:01 to 16Dec31 23:59	A0439 / 15
8	RWY 15R 9000FT dist remaining sign left side not LGTD	16Jan01 00:01 to 16Dec31 23:59	A0439 / 15
9	RWY 33R 1000FT dist remaining sign left side not LGTD	16Jan01 00:01 to 16Dec31 23:59	A0439 / 15

NOTAM List

Interactive Map

Airport NOTAM with Semantical Annotations



EFB – Select Flight

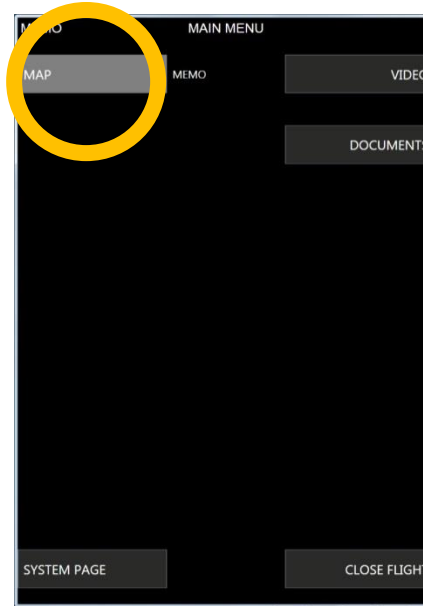
INIT FLIGHT

Flight Number: UAE127

CANCEL CONFIRM

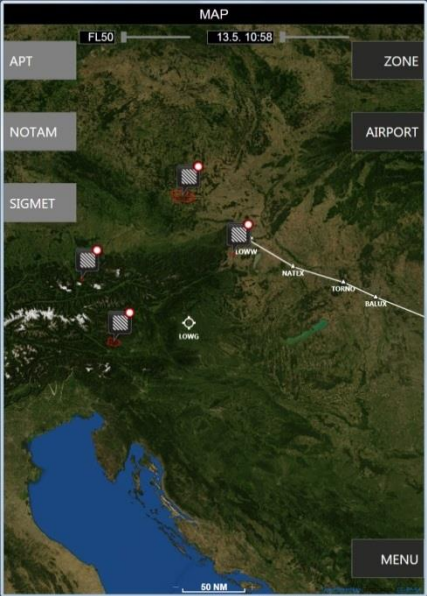
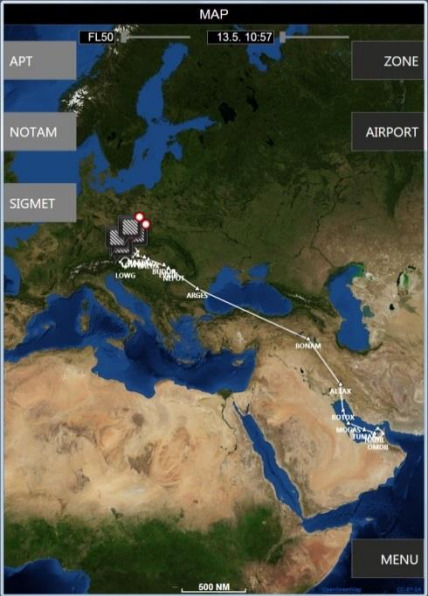
SESAR 9.11
Honeywell

EFB – View Map



SESAR 9.11
Honeywell

EFB – Map View



SESAR 9.11
Honeywell



EFB – Airport

AIRPORT

LOWG: Graz Thalerhof

METAR

METAR LOWG 130850Z 02KT 10 FEW012 SCT066 BKN150 15/12



Runway 17C - Water_WetSnow(2mm)/Water_WetSnow(2mm)/Water_WetSnow(2mm) Medium/Medium/Medium.
Contamination RWY 17C 100%/100%/100% Dampness due to chemicals.
Taxiways: Water_WetSnow Aprons: Water_WetSnow



TWY S, S1 - S4 aerodrome operator may, if necessary, limited or extend operations for unpaved movement areas to specified ACFT types:
details at aerodrome operations +43 (0) 316 2902 120.
ICAO marking may be not visible on grass TWY S, S1 - S4.



TWR must be notified during start-up request of any requirement to use cross-bleed start procedure.
Engine test runs have to be coordinated with the airport duty officer in advance.
TWR approval must be obtained during start-up request.
Minimum power is to be used when taxiing away from stand.



Apron west
aerodrome operator may, if necessary, limited or extend operations for unpaved movement areas to specified ACFT types:
details at aerodrome operations +43 (0) 316 2902 120.
ICAO marking MAY be not visible on apron west



Grass RWY 17R/35L
aerodrome operator may, if necessary, limited or extend operations for unpaved movement areas to specified ACFT types:
details at aerodrome operations +43 (0) 316 2902 120.
ICAO marking MAY be not visible on grass RWY 17R/35L



Apron west closed for fix-wing ACFT.



Ground handling will be stopped in case of lightning activity.
Information to the crew will be provided by the traffic handling agent. Follow me to the parking position is available.

BACK

SESAR 9.11
Honeywell

MEMO

AIRPORT

OMDB: DUBAI INTL

METAR

METAR OMDB 130500Z 1704KT 10 CAVOK000 31/12

TAF

TAF OMDB 130055Z 130208
17005KT P6SM NSW NSC000
TEMPO 0818 31010KT P6SM NSW NSC000
TEMPO 1808 17005KT P6SM NSW NSC000



RUNWAY 12L/30R CLOSED on OMDB

BACK

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Conclusion

- MosaiX SWIM provides all building blocks for the SWIM **Technical Infrastructure**
- MosaiX SWIM enables organisations to **unlock and monetize** their data
- SWIM Information- and Service Models allow **new services** like Digital Briefing
- SemanticNOTAM adds **additional intelligence** to Digital Briefing