av1	data	trans
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device package	comment
Activ8rLives Body Analyser com.activ8rlives.mobile	executing attacks on traffic to reveal that most of the messages are not authenticated at all; also passwords are transmitted in clear text registered and collected data; measurement captured aggregated from teststeps
FitBit aria com.fitbit.FitbitMobile	captured data and viewed in dashboard; single measurement only aggregated from teststeps
HAPI Connected Scale com.hapiconnect	replay tampering and injection tested test run to collect data from app only; registered, paired and executed measurements; on device firewall was limitting data collection to app only aggregated from teststeps
iChoice S1 com.medm.medmwt.diary	ran some attacks against the data in transmission dawith firewall activated registered, paired and collected data raggregated from teststeps
Thomson TBS705 com.stabxtom.thomson	tried to tamper with traffic by manipulating requests and stealing the session to use it to inject further measurements however data couldnt be synchronized back into the application (even after deleting all app data the app doesnt intially download all dataa from server; previous measurements are simply lost collected data with firewall on device activated aggregated from teststeps
Withings WS-30 com.withings.wiscale2 iChoice S1 com.medm.ichoice.diary	recorded registration and measurements with active firewall aggregated from teststeps tampered with data and executed some replay attacks; data is not validated and can cause server errors if weight to high created data and inspected traffic

av1_data_trans

test step	rating	desc	Activ8rLives Body Analyser com.activ8rlives.mobile	FitBit aria com.fitbit.FitbitMobile	HAPI Connected Scale com.hapiconnect	iChoice S1 com.medm.medmwt.diary	Thomson TBS705 com.stabxtom.thomson	Withings WS-30 com.withings.wiscale2	iChoice S1 com.medm.ichoice.diary
av1_inject	vulnerable: 1 / not vulnerable: 0	inject new data to the stream	requests with new measurements are not authenticated and measurements are mapped by userid; so as soon as one finds out a user ID measurements can be happily inserted	engineering the transfer protocol	with reconstructing the		1 injection is possible	1 possible as long as scale has session and this can be used	1 possible since records just come with UUID and the auth token seems to be valid for quite some time
av1_replay	vulnerable: 1 / not vulnerable: 0	finding some way to replay information to the server	as only one record per day can exist	replay possible and will	simple replay is not possible due to client		1 replay attacks are perfectly possible even with stolen session ID however the generated data seems to be unaccessible to the user	1 replay attacks are possible within the same session session is requested based on a once which is used to generate a hash the server is able to use that hash to identify the user and sends user information including a valid session key	0 no; UUID defeats a simple replay attack
av1_ssl	not using SSL: 1 / using SSL: 0	is using SSL	0 using SSL	0 using ssl		0 using SSL	1 no SSL	0 using SSL	0 yes

av1_ssl_forg	vulnerable: 1 / not vulnerable: 0	communication	1 working - username and password in message body clear text	0 not working	1 no SSL usage	0 not working	1 working - username in clear text, mobile id and password somehow encrypted or obfuscated	0 not working	1 yes, trustmanager issue
av1_ssl_forg_ca	vulnerable: 1 / not vulnerable: 0	data ages agl forg the	1 working as without CA certificate	1 working	1 NO SSL - username in cleartext and password somehow encrypted or obfuscated	0 not working	1 NO SSL	1 working	1 vulnerable as for other
av1_tamper	upper limit e.g.	tampering the data before it can reach the	99999999 kg can be entered; beyond that the server will respond with an error		in time	1 records can be changed but still the max weight is validated and limited to 300kg	• •	data can be changed and apparently the server is not validating the data so that unplausible data can be entered tried to change the user ID so that the data would be inserted into a different account -> that however was not successful	1 changes possible within the limits of up to 300 kg
				4.0	6.0	2.0	7.0	5.0	4.0
		21	12 mobile d	lovico					

av2_mobile_device

device comment package Activ8rLives Body Analyser used some basic app functions to generate data com.activ8rlives.mobile FitBit aria investigating application data com.fitbit.FitbitMobile **HAPI Connected Scale** investigating the device com.hapiconnect iChoice S1 looking for data leakage com.medm.medmwt.diary Thomson TBS705 found way too much information in the device logs com.stabxtom.thomson Withings WS-30 run the app to synchronize and export app data to disk for further investigation com.withings.wiscale2 iChoice S1 using app for a while com.medm.ichoice.diary

				0	المالمة					
test step	rating	desc	Activ8rLives Body Analyser com.activ8rlives.mobile	FitBit aria	Mobile_d HAPI Connected Scale com.hapiconnect	iChoice S1	Thomson TBS705 com.stabxtom.thomson	Withings WS-30 com.withings.wiscale2	iChoice S1 2 com.medm.ichoice.diary	
			0	2	2	1	2	2	2	
av2_export_backup	data not encrypted: 2 / data in backup encrypted: 1 / no data stored: 0		no data in backup found	database not encrypted and shared prefs in clear text	• • • • • • • • • • • • • • • • • • • •	sqlite databases not encrypted; shared preferences are obscured and encrypted		database is available and data can be read in clear tex	data in caches but unencrypted t	
			0	0	1	0	1	0	0	
av2_export_logging	information Javailable: 1 / no information: 0	investigate the Android log for unencrypted information	no suspicious data in logging information	no information in log file	logging contains detailed information or every single request send to the server	no information leaked in logcat	logcat shows detailed logs with even some information on the recorded data and partly http traces bluetooth connection management is shown in full including MAC addresses which are logged and saved		no additional logging information	
			0.0	2.0	3.0	1.0	3.0	2.0	2.0	
			av3_mobile_	арр						
device package				comment						
Activ8rLives Bo Analyser com.activ8rlives.m	setting up	user account an	d checking password polic	cies						
FitBit aria com.fitbit.FitbitMo	obile application	n possible paired	age failed; registration was d scale again and configure investigating the app and	ed wifi ; this time better t						
HAPI Connected S com.hapiconne	registered	d user and setup a	app change passwords an	d analysed traffic						
iChoice S1 com.medm.medmw	registered	d user and provide	ed some basic data							
	ran reges	tration test steps	paired the scale with the a	pp tried some input vali	dations, injection, ta	impering by				
Thomson TBS7	,	•	ck the password change pr			•				
COIII.StabAtom.thoi			me after the victim opened ssword hash password ch			e tratilic and hence				
Withings WS-3		•	le and saw some weird inp	•		manual entry added				
com.withings.wisc	cale2 and uploa	aded to withings s	server aggregated from tes	tsteps password change	e and export tests					
iChoice S1 com.medm.ichoice	iChoice S1 registered user and investigated app collected data com.medm.ichoice.diary									
av3 mobile app										
			Activ8rLives Body		PI Connected					

test step	rating	desc	Analyser	FitBit aria	Scale	iChoice S1	Thomson TBS705	Withings WS-30	iChoice S1
			com.activ8rlives.mobile	com.fitbit.FitbitMobile	com.hapiconnect	com.medm.medmwt.diary	com.stabxtom.thomson	com.withings.wiscale2	com.medm.ichoice.diary
av3_code_comment	informational	any comment on the code	app crashing with Android 6.0.1 so reverting back to Android 6 also App is Xamarin based and running in Monodroid VM on Android which is some C style based implementation	tbd tbd	hased with MD5 no salt; after re login signature looks suspicious as no password is transmitted - seems to	just a few lines and decompiled code doesn't show all the information hence something must have been applied to the code also certificate pinning is implemented and had to be removed in order to run further	code shows many different frameworks and addons integrated with the solution (also see addons table) the app itself shows less possibilities to make actually use of these frameworks and addons the password seems to be MD5 hashed but since the communication is not encrypted and the hash is not randomiyed that is pointless, simply use the hash value to execute anything	tbd	java coding with native dependencies
av3_data_coll	informational	data collected and send by the mobile app	the phone	weight can be entered and other fitness data	not possible to enter data manually	manual input only and photo capture to set profile picture	weight data but also sends phone identifier to china	added entry manually to be uploaded to server API with server seems to be different from the scales API query parameters instead of body but everything is SSL encrypted some input validation inside the mobile application is done; manual entries are possible; no othe seems to be transmitted	weight can be entered manually and is limited to 300
av3_data_leakage	privacy policy: 1 /	identifiable for the user or the phone that is being collected	xamarin framework is sending the android device id home and is tracking different events such as network change from wifi to Ite, application startup and a full device fingerprint including attributes such aus screensize, resolution, network, model, memroy, cpu count, android version, client version, app installed	0 device fingerprinting and application usage tracking but without any personal data; all data is being send to mixpanel.com	so data can easily be read; in addition	•	_	1 none	0 no leakage identified
av3_data_wipe	unsecure feature: 1 / secure feature: 0	can data be wiped from the mobile application	1 no possibility to wipe data from inside the app	1 no feature		1 no data wipe option	no data wipe from within the	1 no possibility to wipe data from app or from device, no way to delete account	1 no option

							leading to a contact address		
			n/a	n/a	n/a	n/a	n/a	n/a	n/a
av3_export_cloud	unsecure feature: 1 / secure feature: 0	exported somewhere into the cloud (dropbox et al)	n/a	no export possible	screenshots can be exported which show some graph with weight overview	n/a	no possibility	no export option in app	n/a
		can data be	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	unsecure	CD cord or	n/a	no export possible	n/a	n/a	no option	no export option	n/a
av3_export_sdcard	feature: 1 / secure feature: 0	other locations on device and is that data encrypted		по опрек реселью				s.ps. op.o.	
		export	n/a	0	0	n/a	0	n/a	n/a
av3_export_social	unsecure feature: 1 / secure feature: 0	variation to	n/a	connection to facebook possible but for information only	screenshot of the graph can be shared with any 3rd party app	n/a	twitter, facebook and email but none of them worked	sharing is just inviting and as such possible to gmail, drive, bluetooth and android beam	n/a
		exporting							
	no period or	password change period	n/a	n/a	2	n/a	2	2	n/a
av3_pwd_change_freq	frequency: 2 / either one: 1 / both: 0	(must) and		n/a	nothing enforced	n/a	no password change policy or frequency enforced	n/a	n/a
		password	n/a	n/a	1	n/a	1	n/a	n/a
av3_pwd_change_policy	/ mixed	policy enforced on password change	n/a	n/a	min 6 characters	n/a	password policy is just 6 characters only and nothing else	n/a	n/a
	yes,								
	unlimited: 0 /	can a	n/a	n/a	1	n/a	2	n/a	n/a
av3_pwd_change_reuse	no, but history can be bypassed (see change freq): 1 / no without limitation: 2	password be reused and how much difference is required	n/a	n/a	last password can't be reused	n/a	passwords can be reused at any point in time how often ever the user wants to	n/a	n/a
			2	n/a	2	2	2	2	2
av3 rea acc verif	verification: 1 / two factor	verification or	received no email on account verification / registration		not at all	no - but received email with pointers to privacy statements and similar stuff		there is no trace of account verification not even a single email was received assumption that this might be solution dependent as the withings watch caused a lot of spam in the inbox	received registration confirmation email
av3_reg_data_input	informational	Specifies the data fields and types which are required as inputs	weight, height, waistline, birthdate and bio data, fitness goal and setps towards the goal basic validation on weight, height and waistline	n/a n/a	username, email, weight and height, and password	only email address and password mandatory; name, birth date and height can be entered later from within the app	gender, name, birthday, height,	select scale n email and password n firstname, lastname, birthdate, height, weight	name, email, gender optionally later weight, height and profile picture

			data	0	n/a	0	0	0	0	1
av3_reg_da	ata_validation	data not validated: 1 / data is validated: 0		basic validation on weight, height and waistline	n/a		height and weight are limited; no other validation	limited values for weight, height, waistline, age	email adress is validated n password provided A n very high weights are not allowed 600lb but weird error message n height is accepted at 3m	limited to 300 height and weight
					n/a	1	1	1	0	1
av3_reg	_pripol_link	no link or information: 1 / link available: 0	kind of	link to terms and conditions plus acceptance of terms and conditions is required to use	n/a	no explicit link visible	not visible during registration but linked from within the app	no link to privacy policy apparent	link to privacy policy is provided http://www.withings.com/uk/en/lega also terms and conditions but both links are pointing to the same webpage1	no link visible
		no policy: 2 /		2	n/a	1	1	1	2	1
av3_reg_	_pwd_policy	min characters: 1 / mixed charsets: 0	enforced		n/a	min 6 characters	min 6 character	6-16 characters	no hint to any kind of password policy could be found	min 6 characters
				7.0	1.0	11.0	6.0	12.0	8.0	6.0
				ov/ third	nout.					

av4_third_party

device comment package

Activ8rLives Body Analyser
com.activ8rlives.mobile leakage of data to xamarin

FitBit aria no data being leaked com.fitbit.FitbitMobile

HAPI Connected Scale com.hapiconnect investigating data leakage

iChoice S1
com.medm.medmwt.diary
no data leakage found

Thomson TBS705 data leakage to third party investigated

Withings WS-30 data leakage

com.withings.wiscale2

iChoice S1
com.medm.ichoice.diary
no leakage observed

				av ²	4_third_p	arty			
test step	rating	desc	Activ8rLives Body Analyser com.activ8rlives.mobile	FitBit aria com.fitbit.FitbitMobile	HAPI Connected Scale com.hapiconnec	iChoice S1	Thomson TBS705 com.stabxtom.thomsor	Withings WS-30 n com.withings.wiscale	iChoice S1 2 com.medm.ichoice.diary
			1	0	1	0	1	0	0
av4_data_leakage	no data leaked: 0 / complies with privacy policy: 1 / data leaked beyond privacy policy: 2	data leakage to third party services	detailled data on the device is leaked to xamarin servers; this data can be used for fingerprinting and shouldn't be collected; there are other device identifiers that can be used /n pictures taken are uploaded to an image service and not to their own servers	no data being leaked so far	no data leakage apparent	no data leakage to third party on recor d	data is being leaked to advertising companies; data includes phone identifier information	no data being leaked	no leakage observed
			1.0	0.0	1.0	0.0	1.0	0.0	0.0
		a	v5_sensor_c	levice					
device package				comment					
Activ8rLives Be Analyser com.activ8rlives.r	connecte	ed scale and did s	ome measurements						
FitBit aria com.fitbit.FitbitM		easurements with 9, 76.0 to 76.1	the scale captured firmwar	e being send to the sca	le measurements w	rith increasing weight			
HAPI Connected com.hapiconn		cale but the app e n test cases	nded up in some loop send	ling the same request in	nfintely running pair	ring and data			
iChoice S1 com.medm.medmv	wt.diary paired d	evice and did som	ne measurements						
Thomson TBS: com.stabxtom.tho	collected	d some data by we	eighting and sending data t	o web server					
Withings WS-com.withings.wis	withings defeat the scale2 uploade scale wi	webserver is http e http vulnerability d to withings; adde	ing bluetooth but didnt wor only; possibly can be expl y as the scale partly comm ed a new user within the sa its; replay attacks are likely e downloaded	oited for replay attacks a unicates via https collec ame account, but withing	as well; maybe firm cted data from scale gs offers as well to	ware update will and successfully associate the same			
iChoice S1 com.medm.ichoice	e.diary collected	d data from scale							

				av5_	sensor_d	levice			
test step	rating	desc	Activ8rLives Body Analyser com.activ8rlives.mobile	FitBit aria com.fitbit.FitbitMobile	HAPI Connected Scale com.hapiconnect	iChoice S1 com.medm.medmwt.diary	Thomson TBS705 com.stabxtom.thomsor	Withings WS-30 com.withings.wiscale2	iChoice S1 com.medm.ichoice.diary
av5_data_coll	informational	characteristics of data collected by the sensor	collecting data from scale and transferring it immediately without any user interact the webservice	weight and bodyfat; data	uploaded; as far as seen no other data is	collects data from scale as expected and save's on device; after some time it will be synchronized to the server	collecting weight information just as expected	data is being transmitted via http only scale is able to display the weather of the day other then that it just collects a measurements with a UNIX timestamp and the weight in g this a JSON document being posted to the server also location information is send to the scale and used by it; this communication is encrypted	measurement just as expected; can be tampered and injection possible as long as auth token is valid
av5_pairing_proces	ss informational	pairing process between sensor and phone	no pairing process as such as the scale doesn't authenticate itself with the app but communicates anonymously	web page where the user has to login to a account; after obtaining a registration	without real device pairing using a	pairing comes again without real bluetooth pairing. interestingly the device asks for location access rather than bluetooth access permission	no real pairing	pairing is possible via bluetooth to the phone; it requires an authentication and is persisted; thereafter the scale is able to communicate via wifi or bluetooth with the server	no real pairing process
av5_swfw_update	vulnerable: 1 / no	ot update cycle related issues	doesn't show any hint	0 firmware is queried from scale after uploading new measurements; firmware can be updated on a regular basis	1 communication between app and server doesn't show any hint of information on possible firmware updates	1 no version information exchanged between app and server	1 scale sends its version on registration to the server but doesn't expect any updates	o scale asks server if any firmware update is available and provides the currently installed version intercepting this request and changing the firmware yields a link to an update send by server	1 no software or firmware update cycle
			1.0	0.0	1.0	1.0	1.0	0.0	1.0

av6_web_application

device comment package

Activ8rLives Body

Analyser basic ellaboration of the web page user registration via web page

com.activ8rlives.mobile

FitBit aria com.fitbit.FitbitMobile

gathered data on web page; attention: wlan SSID is mentioned on web page

HAPI Connected Scale

data input tests and testing manipulation investigated web page com.hapiconnect

iChoice S1

com.medm.medmwt.diary explored web access tested for csrf vulnerability

Thomson TBS705

no web page found which would come with the solution com.stabxtom.thomson

Withings WS-30

investigate if account can be delete with spoofed information --> account can't be deleted with stolen session id from

com.withings.wiscale2 unencrypted sensor device communication

iChoice S1 com.medm.ichoice.diary

registered and researched web interface

av6_web_application

test step	rating	desc	Activ8rLives Body Analyser com.activ8rlives.mobile	FitBit aria com.fitbit.FitbitMobile	HAPI Connected Scale com.hapiconnect	iChoice S1	Thomson TBS705 com.stabxtom.thomsor	Withings WS-30 iChoice S1 n com.withings.wiscale2 com.medm.ichoice.diary
av6_csrf	vulnerable: 1 / not vulnerable: 0		csrf token are not renewed after request so that if an attacker manages to steal one of them he is able to send requests for the duration of the session; csrf token is correctly bound to the session	9	•	0 not vulnerable is using authenticity tokens for requests	n/a n/a	0 protected
av6_data_input	data not validated: 1 / data is validated: 0	data input via web UI and validation	0 data is limited to max 300kg	weight data and other measurement data can be entered on web page	data is not validated since unreasonably high measurements can be entered	1 data is not validated but sanitized	n/a n/a	0 limited
av6_data_wipe	insecure feature: 1 / secure feature: 0	wipe and delete data from the web account	one for deactivation and one	o no feature implemented but possible per email request; sender email has to be the account email	0 no option	0 account deletion possible	n/a n/a	0 account can be deleted but has 7 days period before they claim that data will actually be removed from their systems

	insecure	data being	n/a	n/a	n/a	n/a	n/a	n/a
av6_export_cloud	feature: 1 /	exported somewhere into	no export options	n/a	n/a	n/a	n/a	n/a
	secure feature: 0	the cloud (dropbox et al)	no export options	174	174	1,, 4	104	174
		can data be						
	insecure	exported to SD	0	0	n/a	0	n/a	0
av6_export_disk	feature: 1 / secure feature:	card or other locations on	excel document can be exported and data within that	your data belongs to you - comment and download via	n/a	download as csv or html page	n/a	only after account deletion data can be downloaded
	0	device and is that data	document is unencrypted	htt				
		encrypted						
			n/a	0	0	n/a	n/a	n/a
		export variants	no social sharing other than	social sharing possible but	facebook, twitter	only within the same platform	n/a	no hint that data can be
av6_export_social	insecure feature: 1 /	to social media and data	the web platforms own sharing is implemented; carer can be					shared online
uvo_export_social	secure feature: 0	encryption while	invited and also practitioners	C				
		exporting	and clinics can get access; however that feature was not					
			working					
			0	0	0	0	n/a	0
av6_pri_pol	no link or information: 1 /	pirvacy poclicy linked and	the privacy policy is linked	accessible from the page	link in footer but not	linked on web page	n/a	visibly linked from web
	link available: 0		from the web page	footer area where it is linked	very visible			interface
av6_pwd_change_freq	no period or frequency: 2 /	password change period	2	2	2	2	n/a	2
uvo_pwu_cnange_neq	either one: 1 / both: 0	(must) and frequency (can)	not implemented	no frequency defined	none	none	n/a	no frequency enforced
	no policy: 2 /	password policy	2	1	1	1	n/a	1
av6_pwd_change_policy	min oborootoro:	enforced on	none	min 8 characters	6 characters	min 6 characters	n/a	min 6 char; any char no type
	charsets: 0	password change	TIONE	min o ondidotors	o characters	min o characters	174	enforcement end to type
	yes, unlimited: (0	0	0	0		2
	/ no, but history can be	can a password be reused and	2	2	2	2	n/a	
av6_pwd_change_reuse	bypassed (see	how much	none	unlimited reuse	unlimited	not limited	n/a	unlimited reuse
	change freq): 1 / no without	required						
	limitation: 2 none: 2 / email							
	account	email account verification or	2	1	2	1	n/a	2
av6_reg_acc_verif	verification: 1 / two factor	two factor	none	account verification per email send but not enforced	no	no just email with confirmation that account has been created	n/a	no verification
	authentication 0			email send but not emoleco		that account has been created		
		Specifies the data fields and	same as app	mail, name, dob, weight	name, email, date of	same as app	n/a	same as mobile app
av6_reg_data_input	informational	types which are required as		(limited), height (limited)	birth, goals		n/a	
		inputs						
		Comments on	0	0	1	0	n/a	0
	data not validated: 1 /	data validation during user	0	O	1	0	n/a	
av6_reg_data_validation	data is	registration:	same as app: only medical data	sanitized and validated	no	same as app	n/a	some data validation for height and weight
	validated: 0	weight, heitght,						

		email						
av6_reg_pripol_link	no link or	Killia oi	1 not visible but very hidden in footer	0 privacy policy link is available and has to be acknowledged; in addition hint that data is transferred to the US	1 not visible but very hidden in footer	0 visible in registration form	n/a n/a	0 yes
	no policy: 2 / min characters: 1 / mixed charsets: 0	noliny onforced	2 no	1 min 8 character	1 min 6 characters	1 min 6 characters	n/a n/a	1 min 6 char
av6_sql_injection		queries to learn	0 protects against basic sql injection	0 not possible	0 no	0 not possible	n/a	