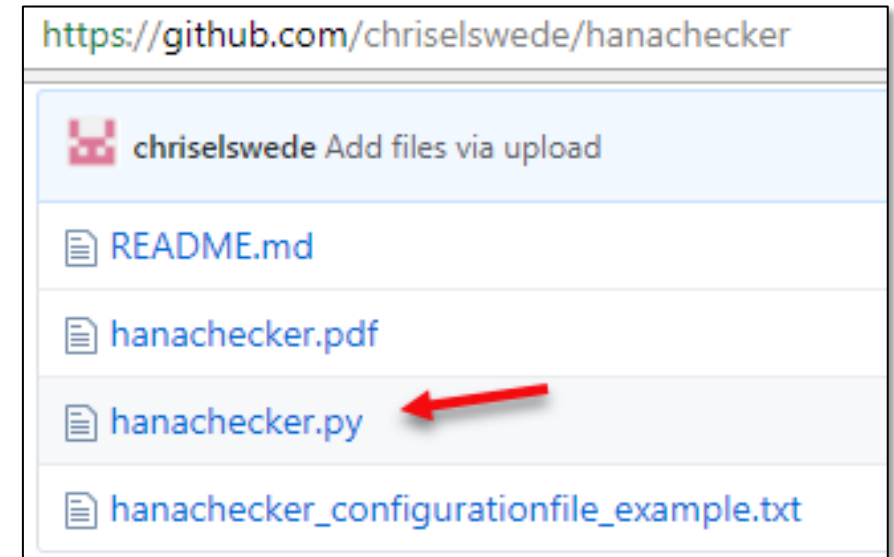




SAP Note 1999993 presents a tool that runs the mini-checks (SAP Note 1969700) and sends out emails in case of potential critical issues

1999993 - How-To: Interpreting SAP HANA Mini Check Results

- It is a python script to be downloaded from <https://github.com/chriselswede/hanachecker>
- It is intended to be executed as <sid>adm on your SAP HANA Server
- It connects via host, port and DB user, provided in hdbuserstore
- It sends out emails via an intern smtp server (to avoid firewall issues) with xmail



NOTE: You have to install the linux program "sendmail" and add a line similar to `DSsmtp.intra.ourcompany.com` in the file `sendmail.cf` in `/etc/mail/`, see [this page](#)



Host, port and DB user needs to be provided in the hdbuserstore:

```
hsiadm@dewdfglp00835:/> hdbuserstore SET HANACHECKER1KEY dewdfglp00835:30015 HANACHECKER1 PassWord1
hsiadm@dewdfglp00835:/> hdbuserstore LIST
DATA FILE      : /usr/sap/HSI/home/.hdb/dewdfglp00835/SSFS_HDB.DAT
KEY FILE       : /usr/sap/HSI/home/.hdb/dewdfglp00835/SSFS_HDB.KEY

KEY HANACHECKER1KEY
  ENV : dewdfglp00835:30015
  USER: HANACHECKER1
```

Then the hanachecker can connect using the info stored in hdbuserstore:

```
hsiadm@dewdfglp00835:/tmp/HANAChecker> whoami
hsiadm
hsiadm@dewdfglp00835:/tmp/HANAChecker> python hanachecker.py -k HANACHECKER1KEY -ff hanachecker_configurationfile.txt
"Mini Check ID 235  Description: Hosts with varying physical memory size Host:  Value: yes Expectation: no Potenti
```



The DB user that hanachecker uses to connect with needs proper privileges to run the mini-checks

The DB user that hanachecker uses only needs to read in the statistics server tables

User Name*:	<input type="text" value="HANACHECKER1"/>	<input type="checkbox"/> Disable ODBC/JDBC access
Authentication		
<input checked="" type="checkbox"/> Password		
Password*:	<input type="password" value="●●●●●●●●"/>	Confirm*: <input type="password" value="●●●●●●●●"/>

Granted Roles			System Privileges	Object Privileges	Analytic Privileges	Package Privileges
+ x						
Role		Grantor				
MONITORING		SYSTEM				
PUBLIC		SYS				



HANAChecker can take the SQLStatements.zip file as input

- The .zip file has to be downloaded from SAP Note [1969700](#)
- HANAChecker will use the corresponding check files based on your HANA revision

Flag	Details	Explanation	Default
-zf	Full path to SQLStatements.zip	Full path of the SQLStatements.zip file (SAP Note 1969700). Cannot be used together with -mf and must be used together with -ct	"
-ct	Check Types	M = Mini-Checks, I = Internal Mini-Checks, S = Security Mini-Checks, T = Trace Mini-Checks, P = Parameter Checks (see some slides below), C = Call Stacks Mini-Checks (see some slides below), R = SQL Recommendations (see some slides below), A = ABAP Mini-Checks (see some slides below)	"

Example:

```
mo-fc8d991e0:/tmp/HANAChecker> python hanachecker.py -zf SQLStatements.zip -ct M,I,S,T -M1142
lena@comp.com -S0120 chris@du.my -T0101 per@du.my -en chris@comp.com,smtp.intra.comp.com

"Mini Check ID S0120 Description: SYSTEM user deactivated Value: no Expectation: yes C: X"
is sent to chris@du.my
"Mini Check ID T0101 Area: Statistics server Description: Unique constraint violation Host:
mo-fc8d991e0 Port: 30003 Count: 24 LastOccurrence: 2018/03/07 08:33:41 C: X SAPNote: 214
7247 TraceText: plan plan6992814@mo-fc8d991e0:30003 failed with rc 301; unique constraint vio
latedTrexUpdate failed on table ' SYS_STATISTICS:HOST_LOAD_HISTORY_HOST_BASE' with error: uniq
ue constraint violation in self check for table SYS_STATISTICS:HOST_LOAD_HISTORY_HOST_BASEen,
constraint='$trexexternalkey$', udiv='2018-03-07 08:33:38;12,mo-fc8d991e0;2018-02-23 07:03:27
.215', pos=708, indexname= SYS_TREE_CS #150584 #0 #P0, rc=55" is sent to per@du.my
"Mini Check ID M1142 Description: Table(s) using > 10 % of SQL cache Host: mo-fc8d991e0 Val
ue: 2 Expectation: 0 C: X SAPNote: 2124112" is sent to lena@comp.com
```



HANAChecker takes a mini-check SQL statement file as input (Note: -mf not needed if you use -zf and -ct)

- Note: Always use the mini-check file that corresponds to your SAP HANA Revision and download these files regularly from SAP Note [1969700](#) to always have the latest versions, as SAP Note [1969700](#) is being updated frequently

Flag	Details	Explanation	Default
-mf	mini-check file	Full path of the mini-check file (Cannot be used together with -zf)	"

Possible Files:	CHID	Example
HANA_Configuration_MiniChecks_<revision>.txt	MXXXX	M0231
HANA_Configuration_MiniChecks_Internal_<revision>.txt	IXXXX	I0076
HANA_Security_MiniChecks.txt	SXXXX	S1045
HANA_TraceFiles_MiniChecks.txt	TXXXX	T1200
HANA_Configuration_Parameters_<revision>.txt (see some slides below)		
HANA_Threads_Callstacks_MiniChecks_<revision>.txt (see some slides below)	CXXXX	C1013
HANA_SQL_SQLCache_TopLists_<revision>.txt (see some slides below)		
HANA_ABAP_MiniChecks.txt (see some slides below)	AXXXX	A0510

Example:

```
mo-fc8d991e0:/tmp/HANAChecker> python hanachecker.py
-mf HANA Configuration MiniChecks 1.00.120+.txt -en c
hris@comp.com,smtp.comp.com -M1115 chris@du.my
```



HANAChecker can send out emails for all critical mini-checks

The HANAChecker executes the mini-checks and sends out emails for every mini-check that are “Potential Critical”, i.e. the column “C” has an “X” in it

For this to work (see [this page](#) for more information):

- an internal smtp server has to be used, e.g. ourcompany.intra.com,
- the Linux program “sendmail” has to be installed and
- a line like DSsmtp.intra.ourcompany.com in file sendmail.cf in /etc/mail/ has to be added

The sender’s email address and the internal smtp email server has to be provided:

Flag	Unit	Details	Explanation	Default
-en		email-notification	<sender’s email>,<mail server>	“

Example:

```
mo-fc8d991e0:/tmp/HANAChecker> python hanachecker.py -mf HANA_Configuration_Min Checks_1.00.120+.txt -en chris@comp.com,smtp.intra.comp.com -M1115 chris@du.my
```



HANAChecker sends out emails to the addresses mapped for the mini-checks

If the flag -<CHID> is specified for a email address and the mini-check with that check id (CHID) is potential critical then an email is send to that email address

Flag	Unit	Details	Explanation	Default
-<CHID>		mini-check to email address	If that particular mini-check specified by the flag is potential critical an email is sent to the addresses specified by the value of the flag	

Example (mini-checks):

```
mo-fc8d991e0:/tmp/HANAChecker> python hanachecker.py -mf HANA_Configuration_MiniChecks_1.00.120+.txt
-en chris@comp.com,smtp.intra.comp.com -M1142 chris@du.my -M1150 per@du.my,lena@du.my

"Mini Check ID M1142 Description: Table(s) using > 10 % of SQL cache Host: mo-fc8d991e0 Value: 2
Expectation: 0 C: X SAPNote: 2124112" is sent to chris@du.my
"Mini Check ID M1150 Description: Pinned statements in SQL cache (%) Host: mo-fc8d991e0 Value: 27
.83 Expectation: <= 20.00 C: X SAPNote: 2124112" is sent to per@du.my
"Mini Check ID M1150 Description: Pinned statements in SQL cache (%) Host: mo-fc8d991e0 Value: 27
.83 Expectation: <= 20.00 C: X SAPNote: 2124112" is sent to lena@du.my
```

Example (security mini-checks):

```
mo-fc8d991e0:/tmp/HANAChecker> python hanachecker.py -mf HANA_Security_MiniChecks.txt -en chris@comp.
com,smtp.intra.comp.com -S0120 lena@du.my

"Mini Check ID S0120 Description: SYSTEM user deactivated Value: no Expectation: yes C: X" is sen
t to lena@du.my
```


Monitoring

HANAChecker – Only One Email



HANAChecker can be told to only send one email per email address

The flag `-oe` flag tells HANAChecker that if one email address is supposed to get notified by many mini-check warnings, they are sent in only one email

Flag	Unit	Details	Explanation	Default
<code>-oe</code>		one email per address	true: only one email is sent per email address, false: one email is sent per critical mini check	false

Example: Here `lena@du.my` gets only one email, including warnings from mini-check M1142, and M1150

```
mo-fc8d991e0:/tmp/HANAChecker> python hanachecker.py -mf HANA_Configuration_MiniChecks_1.00.120+.txt -en chris@comp.com,smtp.intra.comp.com -M1142 lena@du.my -M1150 lena@du.my -oe true

"Mini Check ID M1142 Description: Table(s) using > 10 % of SQL cache Host: mo-fc8d991e0 V
alue: 2 Expectation: 0 C: X SAPNote: 2124112
Mini Check ID M1150 Description: Pinned statements in SQL cache (%) Host: mo-fc8d991e0 Va
lue: 27.28 Expectation: <= 20.00 C: X SAPNote: 2124112" is sent to lena@du.my
```


HANAChecker – Always Send a Notification Email



HANAChecker can send an email to all unique email addresses even if none of the mini-checks for those addresses seemed critical – just to notify that HANAChecker was executed

Flag	Unit	Details	Explanation	Default
-as		always send at least a notification email	true: all email addresses will be send at least a notification email, even if none of the mini-checks assigned to the emails were potential critical	false

Example: Here all emails, chris@du.my, lana@du.my, and per@du.my, gets the notification email. Note that Per also get the notification email so he will know that the HANAChecker ran even though none of his mini-checks were critical.

```
oqladm@ls80010:/tmp/HANAChecker> python hanachecker.py -zf SQLStatements.zip -ct M -en chris@comp.com,smtp.intra.comp.com
-M1142 chris@du.my,lana@du.my -M1150 per@du.my,lana@du.my -as true
"HANACeacker was executed 2018-06-08 21:42:22 on OQL. If any of the mini-checks that you are responsible for seem critical,
you will be notified now." is sent to lana@du.my
"Mini Check ID M1142 Description: Table(s) using > 10 % of SQL cache Host: ls80010 Value: 1 Expectation: 0 C: X SAPN
ote: 2124112" is sent to lana@du.my
"HANACeacker was executed 2018-06-08 21:42:22 on OQL. If any of the mini-checks that you are responsible for seem critical,
you will be notified now." is sent to per@du.my
"HANACeacker was executed 2018-06-08 21:42:22 on OQL. If any of the mini-checks that you are responsible for seem critical,
you will be notified now." is sent to chris@du.my
"Mini Check ID M1142 Description: Table(s) using > 10 % of SQL cache Host: ls80010 Value: 1 Expectation: 0 C: X SAPN
ote: 2124112" is sent to chris@du.my
```

HANAChecker – Always Send One Email



If both the `-as` and the `-oe` flags are set to true then all email addresses get one email and one email only; the email includes always the notification that HANAChecker ran and then, if any of the mini-checks were critical, those mini-check notifications will follow

Example: Here all email addresses, chris@du.my, lena@du.my, and per@du.my, get one email

```
oqladm@ls80010:/tmp/HANAChecker> python hanachecker.py -zf SQLstatements.zip -ct M -en chris@comp.com,smtp.
intra.comp.com -M1142 chris@du.my,lena@du.my -M1150 per@du.my,lena@du.my -as true -oe true
"HANACecker was executed 2018-06-08 21:44:40 on OQL. If any of the mini-checks that you are responsible for
seem critical, you will be notified now.
Mini Check ID M1142 Description: Table(s) using > 10 % of SQL cache Host: ls80010 Value: 1 Expectation:
0 C: X SAPNote: 2124112" is sent to lena@du.my
"HANACecker was executed 2018-06-08 21:44:40 on OQL. If any of the mini-checks that you are responsible for
seem critical, you will be notified now." is sent to per@du.my
"HANACecker was executed 2018-06-08 21:44:40 on OQL. If any of the mini-checks that you are responsible for
seem critical, you will be notified now.
Mini Check ID M1142 Description: Table(s) using > 10 % of SQL cache Host: ls80010 Value: 1 Expectation:
0 C: X SAPNote: 2124112" is sent to chris@du.my
```

Monitoring

HANAChecker – Email Grouping



HANAChecker sends out emails to the addresses grouped for the checks

The flag -cg can specify ranges of mini-checks and map an email address for each of these ranges

Flag	Unit	Details	Explanation	Default
-cg		mini-check groups	Groupings of mini-checks with responsible email addresses associated	

Example: Here lena@du.my gets emails for every potential critical mini-check between M1140 and M1149 and chris@du.my gets emails for every potential critical mini-check between M1150 and M1159

```
mo-fc8d991e0:/tmp/HANAChecker> python hanachecker.py -mf HANA_Configuration_MiniChecks_1.00.120
+.txt -en chris@comp.com,smtp.intra.comp.com -cg M1140-M1149,lena@du.my,M1150-M1159,chris@du.my

"Mini Check ID M1150 Description: Pinned statements in SQL cache (%) Host: mo-fc8d991e0 Valu
e: 27.28 Expectation: <= 20.00 C: X SAPNote: 2124112" is sent to chris@du.my
"Mini Check ID M1142 Description: Table(s) using > 10 % of SQL cache Host: mo-fc8d991e0 Valu
e: 2 Expectation: 0 C: X SAPNote: 2124112" is sent to lena@du.my
```

HANAChecker – Parameter Email (1/3)



HANAChecker sends out emails to the addresses listed after the flag -pe if there are parameters mentioned by HANA_Configuration_Parameters (SAP Note 1969700)

Flag	Unit	Details	Explanation	Default
-pe		parameter emails	a comma seperated list of emails that catches all parameter checks, this only makes sense if HANA_Configuration_Parameters is included in the input, either with -mf, or -ct P	not used
-is	true/false	ignore check_why_set	parameters that have been set without that there is any recommended value, will be ignored	false

Example: Here per@al.com gets emails for every potential critical parameter issue and if M0208 is potential critical:

```
pqladm@atgls90010:/tmp/HANAChecker> python hanachecker.py -zf SQLStatements.zip -ct M,P
-pe per@al.com -M0208 per@al.com -oe true -k TCHECK
"
Mini Check ID M0208 Description: Supported operating system Host: atgls90010 Value: n
o (SUSE Linux Enterprise Server 12 SP3) Expectation: yes C: X SAPNote: 2235581

Parameter 'global_auditing_state' in configuration file 'global.ini' and in section 'aud
iting configuration' has an internal default value, is not configured, but the recommend
ation is 'true'. For more information see SAP Note 863362. This has priority 2.
Following scenario has been taken into account:
Revision: 2.00.036 Environment: ABAP,ERP,ESS,MDCTEN,SDA,SINGLE,SYSREP,AUD,XFS

Parameter 'default_statement_concurrency_limit' in configuration file 'global.ini' and i
n section 'execution' has default value '0', is not configured, but the recommendation i
s '16 to 40'. For more information see SAP Note 2222250. This has priority 1.
Following scenario has been taken into account:
Revision: 2.00.036 Environment: ABAP,ERP,ESS,MDCTEN,SDA,SINGLE,SYSREP,AUD,XFS CpuThrea
ds: 80
```


HANAChecker – Parameter Email (2/3)



Example: Here chris@dum.com gets emails for every potential critical SAP HANA Parameter issue. We also see that some parameter checked specific scenario, that can be changed in the Modification Section in SQL: HANA_Configuration_Parameters (see also next slide).

```
pqladm@atgls90010:/tmp/HANAChecker> python hanachecker.py -zf SQLStatements.zip -ct P -oe true -pe chris@dum.com -k TCHECK
"
Parameter 'global_auditing_state' in configuration file 'global.ini' and in section 'auditing configuration' has an internal default value, is not configured, but the recommendation is 'true'. For more information see SAP Note 863362. This has priority 2.
Following scenario has been taken into account:
Revision: 2.00.036 Environment: ABAP,ERP,ESS,MDCTEN,SDA,SINGLE,SYSREP,AUD,XFS

Parameter 'default_statement_concurrency_limit' in configuration file 'global.ini' and in section 'execution' has default value '0', is not configured, but the recommendation is '16 to 40'. For more information see SAP Note 2222250. This has priority 1.
Following scenario has been taken into account:
Revision: 2.00.036 Environment: ABAP,ERP,ESS,MDCTEN,SDA,SINGLE,SYSREP,AUD,XFS CpuThreads: 80

Parameter 'log_backup_timeout_s' in configuration file 'global.ini' and in section 'persistence' has default value '7200', is not configured, but the recommendation is '300 to 3600'. For more information see SAP Note 1645183. This has priority 3.
Following scenario has been taken into account:
Revision: 2.00.036 Environment: ABAP,ERP,ESS,MDCTEN,SDA,SINGLE,SYSREP,AUD,XFS

Parameter 'logshipping_max_retention_size' in configuration file 'global.ini' and in section 'system_replication' has default value '1048576', is not configured, but the recommendation is '0 to 656384'. For more information see SAP Note 2526877. This has priority 3.
Following scenario has been taken into account:
Revision: 2.00.036 Environment: ABAP,ERP,ESS,MDCTEN,SDA,SINGLE,SYSREP,AUD,XFS LogVolumeSize: 801
```

HANAChecker – Parameter Email (3/3)



Example: Here per@al.com gets emails for every potential critical SAP HANA Parameter issue. Here SQL: HANA_Configuration_Parameters was changed in the Modification Section (number CPU_THREADS was changed to 50), and the changed version was given as input to the –mf flag:

```
pqladm@atgls90010:/tmp/HANAChecker> python hanachecker.py -mf HANA_Configuration_Parameters_cpu50.txt -pe per@al.com
-oe true -k TCHECK
"
Parameter 'global_auditing_state' in configuration file 'global.ini' and in section 'auditing configuration' has an internal default value, is not configured, but the recommendation is 'true'. For more information see SAP Note 863362. This has priority 2.
Following scenario has been taken into account:
Revision: 2.00.036 Environment: ABAP,ERP,ESS,MDCTEN,SDA,SINGLE,SYSREP,AUD,XFS

Parameter 'default_statement_concurrency_limit' in configuration file 'global.ini' and in section 'execution' has default value '0', is not configured, but the recommendation is '15 to 25'. For more information see SAP Note 2222250. This has priority 1.
Following scenario has been taken into account:
Revision: 2.00.036 Environment: ABAP,ERP,ESS,MDCTEN,SDA,SINGLE,SYSREP,AUD,XFS CpuThreads: 50 (manual)

Parameter 'max_concurrency' in configuration file 'global.ini' and in section 'execution' has default value '0', is not configured, but the recommendation is '50'. For more information see SAP Note 2222250. This has priority 1.
Following scenario has been taken into account:
Revision: 2.00.036 Environment: ABAP,ERP,ESS,MDCTEN,SDA,SINGLE,SYSREP,AUD,XFS CpuThreads: 50 (manual)

Parameter 'log backup timeout s' in configuration file 'global.ini' and in section 'persistence' has default value '7
```



HANAChecker also covers the call stacks mini checks: -ct C

The default value in the modification section of active threads limit, 0.2, is normally fine, but it is possible to change it with the -at flag

Flag	Details	Explanation	Default
-at	active threads	this sets MIN_ACTIVE_THREADS in modification section	(not used, i.e. default value in modification section 0.2 is used)

Example: Here chris@me.com gets emails for all potential critical call stacks mini-checks that have more than 0.01 average active threads

```
hsiadm@atgvmls7071:/tmp/HANAChecker> python hanachecker.py -zf SQLStatements.zip -ct C -ca chris@me.com -en chris@comp.com,smtp.intra.comp.com -k T1SYSKEY -at 0.01
"
Mini Check ID C1013 Area: Locks Description: Futex lock wait Host: atgvmls7071 Port: 30003 Count: 21 Active Threads: 0.0104 LastOccurrence: 2021/03/16 08:13:27 C: X SAPNote: 1999998 TraceText: ptime::Futex::lock" is sent to chris@me.com
"
Mini Check ID C1020 Area: Locks Description: Unlocking of mutex Host: atgvmls7071 Port: 30003 Count: 31 Active Threads: 0.0153 LastOccurrence: 2021/03/16 00:23:27 C: X SAPNote: 1999998 TraceText: Synchronization: :Mutex::unlock" is sent to chris@me.com
```

Example: Here chris@me.com gets an email if C1013 is potential critical and has more than 0.01 average active threads

```
hsiadm@atgvmls7071:/tmp/HANAChecker> python hanachecker.py -zf SQLStatements.zip -ct C -C1013 chris@me.com -en chris@comp.com,smtp.intra.comp.com -k T1SYSKEY -at 0.01
"
Mini Check ID C1013 Area: Locks Description: Futex lock wait Host: atgvmls7071 Port: 30003 Count: 21 Active Threads: 0.0104 LastOccurrence: 2021/03/16 08:13:27 C: X SAPNote: 1999998 TraceText: ptime::Futex::lock" is sent to chris@me.com
```


Monitoring

HANAChecker – SQL Recommendations



HANAChecker sends out emails to the addresses listed after the flag -se if there are recommendations in SAP Note 2000002 for the SQL statements given in the output of HANA_SQL_SQLCache_TopLists

Flag	Details	Explanation	Default
-se	sql emails	a comma seperated list of emails that catches all sql statements with recommendation in SAP Note 2000002, this only makes sense if HANA_SQL_SQLCache_TopLists is included in the input, either with -mf, or -ct R	not used

Example: Here chris@me.com gets emails for every SQL statement with recommendations:

```
hsiadm@atgvmls7071:/tmp/HANAChecker> python hanachecker.py -zf SQLStatements.zip -ct R -se chris@me.com -en chris@comp.com,smtp.intra.comp.com -k T1SYSKEY
"
SQL statement d6fd6678833f9a2e25e7b53239c50e9a is one of the most expensive statements in the SQL cache and there is a recommendation available in SAP Note 2000002.
This SQL statement is of type CA, originates from Statistics server, and executed by the Row engine." is sent to chris@me.com
"
SQL statement 430c496e0fe15c0353c80de1c72caab1 is one of the most expensive statements in the SQL cache and there is a recommendation available in SAP Note 2000002.
This SQL statement is of type SE, originates from Statistics server, and executed by the Row engine." is sent to chris@me.com
"
SQL statement d3759ce6047b78f61d5fc3be392d0336 is one of the most expensive statements in the SQL cache and th
```

HANAChecker – Different Emails Example



Example: Here chris@me.com gets emails for every SQL statement with recommendation, lina@me.com gets emails for some call stacks mini-checks, peter@me.com gets emails for some security mini-checks and ole@me.com gets emails for all configuration parameters that do not follow the recommendations. ...

```
hsiadm@atgvmls7071:/tmp/HANAChecker> python hanachecker.py -zf SQLStatements.zip -ct R,C,S,P -se chris@me.com
-cg C1000-C2000,lina@me.com,S0100-S0300,peter@me.com -pe ole@me.com -at 0.01 -en chris@comp.com,sntp.intra.com
p.com -k T1SYSKEY
"
Mini Check ID S0120 Description: SYSTEM user deactivated Value: no Expectation: yes C: X" is sent to peter@me.com
```

```
...
Mini Check ID C1020 Area: Locks Description: Unlocking of mutex Host: atgvmls7071 Port: 30003 Count: 30
Active Threads: 0.0148 LastOccurrence: 2021/03/17 05:08:27 C: X SAPNote: 1999998 TraceText: Synchronizatio
n::Mutex::unlock" is sent to lina@me.com
```

```
...
SQL statement d6fd6678833f9a2e25e7b53239c50e9a is one of the most expensive statements in the SQL cache and th
ere is a recommendation available in SAP Note 2000002.
This SQL statement is of type CA, originates from Statistics server, and executed by the Row engine." is sent
to chris@me.com
```

```
...
Parameter 'service thread sampling monitor enabled' in configuration file 'global.ini' and in section 'resourc
e_tracking' has default value 'false', is configured to 'true' in ALTER SYSTEM ALTER CONFIGURATION ('global.in
i', 'SYSTEM') SET ('resource_tracking', 'service_thread_sampling_monitor_enabled') = 'true' WITH RECONFIGURE;
layer, but the recommendation is '2114710'. For more information see SAP Note DEFAULT. This has priority 2.
Following scenario has been taken into account:
Revision: 2.00.053 Environment: ABAP,ESS,LCACHE,MDCTEN,MULTI,PROD,SCM" is sent to ole@me.com
```

Monitoring

HANAChecker – ABAP Mini Checks



HANAChecker also covers the ABAP mini checks: -ct C

The ABAP schema must be specified

Flag	Details	Explanation	Default
-abs	ABAP schema	this sets the ABAP schema before HANA_ABAP_MiniChecks.txt is executed	(not set → it must be set)

Example: Here chris@me.com gets emails for all potential critical ABAP mini-checks

```
oqladm@ls80010:/tmp/HANAChecker> python hanachecker.py -zf SQLStatements.zip -ct A -abs SAPQH1 -ca chris@me.com
-en chris@comp.com,smtp.intra.comp.com -k SYSTEMKEY
"
Mini Check ID A0510 Description: Parameter: dbs/hdb/cmd_buffersize Value: wrong (1048576 instead of 2097152 to
10485760) Expectation: like 'okay%' C: X SAPNote: 2600030" is sent to chris@me.com
"
Mini Check ID A0520 Description: Parameter: rsdb/tbi_buffer_area_MB Value: wrong (192 instead of >= 1000) Exp
ectation: like 'okay%' C: X SAPNote: 2600030" is sent to chris@me.com
"
Mini Check ID A0521 Description: Parameter: rsdb/tbi_dir_entries Value: wrong (13200 instead of >= 20000) Exp
ectation: like 'okay%' C: X SAPNote: 2600030" is sent to chris@me.com
"
Mini Check ID A0900 Description: SQLM activated Value: no Expectation: yes C: X SAPNote: 1885926" is sent t
o chris@me.com
"
Mini Check ID A1702 Description: System change option set to modifiable Value: yes Expectation: no C: X" is
sent to chris@me.com
```


HANAChecker – Another Different Emails Example



Example: Here chris@me.com gets an email if A0510 is potential critical, john@me.com gets email an email if T9000 is potential critical, sue@me.com gets an email if M1220 is potential critical, and mila@me.com gets an email if S0120 is potential critical.

```
oqladm@ls80010:/tmp/HANAChecker> python hanachecker.py -zf SQLStatements.zip -ct M,S,T,A -abs SAPQH1 -A0510 chris@me.com
-T9000 john@me.com -M1220 sue@me.com -S0120 mila@me.com -en chris@comp.com,smtp.intra.comp.com -k SYSTEMKEY
"
Mini Check ID T9000 Area: General Description: Max. trace lines per hour Host: ls80010 Port: 30003 Count: 10715 Las
tOccurrence: 2021/03/20 02:00:00 C: X SAPNote: 2380176" is sent to john@me.com
"
Mini Check ID A0510 Description: Parameter: dbs/hdb/cmd_buffersize Value: wrong (1048576 instead of 2097152 to 10485760
) Expectation: like 'okay%' C: X SAPNote: 2600030" is sent to chris@me.com
"
Mini Check ID S0120 Description: SYSTEM user deactivated Value: no Expectation: yes C: X" is sent to mila@me.com
"
Mini Check ID M1220 Description: QCM conversion tables Value: 1 Expectation: 0 C: X SAPNote: 9385" is sent to sue@me
.com
```



HANAChecker can send out emails for all potential critical checks to the emails defined as “catch all” emails

Flag	Unit	Details	Explanation	Default
-ca		catch all emails	The email addresses specified receive an email about each potential critical mini-check and parameter check	

Example:

```
mo-fc8d991e0:/tmp/HANAChecker> python hanachecker.py -mf HANA_Configuration_MiniChecks_1.00.120+.txt -en chris@comp.com,smtp.intra.comp.com -ca peter@du.my,chris@du.my
```

```
"Mini Check ID M0012 Description: Revision level Value: 121.00 Expectation: >= 122.03 C: X SAPNote: 2021789" is sent to chris@du.my
```

```
"Mini Check ID M0115 Description: Service startup time variation (s) Host: mo-fc8d991e0 Value: 3299447 Expectation: <= 600 C: X SAPNote: 2177064" is sent to chris@du.my
```

...

```
"Mini Check ID M0012 Description: Revision level Value: 121.00 Expectation: >= 122.03 C: X SAPNote: 2021789" is sent to peter@du.my
```

```
"Mini Check ID M0115 Description: Service startup time variation (s) Host: mo-fc8d991e0 Value: 3299447 Expectation: <= 600 C: X SAPNote: 2177064" is sent to peter@du.my
```

...

Monitoring

HANAChecker – Ignore Checks



While using the “Catch All” flag, you can “Ignore” some checks with the `-ic` flag, i.e. catch all except some checks

Example:

Flag	Unit	Details	Explanation	Default
-ic		ignore checks	A list of mini-check CHIDs to be ignored by the catch all emails	

Example:

```
mo-fc8d991e0:/tmp/HANAChecker> python hanachecker.py -mf HANA_Configuration_MiniChecks_1.00.120+.txt -en chris@comp.com,smtp.intra.comp.com -ca chris@du.my -ic M0012,M0209

"Mini Check ID M0115 Description: Service startup time variation (s) Host: mo-fc8d991e0 Value: 3299447 Expectation: <= 600 C: X SAPNote: 2177064" is sent to chris@du.my
"Mini Check ID M0551 Description: Proper setup of timezone table TTZZ Value: no Expectation: yes C: X SAPNote: 1791342" is sent to chris@du.my
```

...



One can define different mini-check files with the -mf flag and assign different mini-check types to emails, e.g.

```
-mf <mini-check file>,<security-mini-check file>,...
-cg M0100-M0200,email1@comp.com,S0100-S0200,email2@comp.com
```

Example:

```
mo-fc8d991e0:/tmp/HANAChecker> python hanachecker.py -mf HANA_Configuration_MiniChecks_1.00.120+.txt
,HANA_Configuration_MiniChecks_Internal_1.00.120-1.00.122.99.txt,HANA_Security_MiniChecks.txt,HANA_T
raceFiles_MiniChecks.txt -cg M1100-M1150,chris@du.my,I0010-I1000,john@du.my,S0100-S0125,lena@du.my,T
0099-T0105,per@du.my -en chris@me.com,smtp.intra.me.com
"Mini Check ID M1142 Description: Table(s) using > 10 % of SQL cache Host: mo-fc8d991e0 Value: 2
Expectation: 0 C: X SAPNote: 2124112" is sent to chris@du.my
"Mini Check ID M1150 Description: Pinned statements in SQL cache (%) Host: mo-fc8d991e0 Value: 27
.93 Expectation: <= 20.00 C: X SAPNote: 2124112" is sent to chris@du.my
"Mini Check ID T0101 Area: Statistics server Description: Unique constraint violation Host: mo-fc
8d991e0 Port: 30003 Count: 24 LastOccurrence: 2018/03/05 06:33:41 C: X SAPNote: 2147247 TraceT
ext: plan plan5636987@mo-fc8d991e0:30003 failed with rc 301; unique constraint violatedTrexUpdate fa
iled on table '_SYS_STATISTICS:HOST_LOAD_HISTORY_HOST_BASE' with error: unique constraint violation
in self check for table _SYS_STATISTICS:HOST_LOAD_HISTORY_HOST_BASEen, constraint='$trexexternalkey$
', udiv='2018-03-05 06:33:38;12,mo-fc8d991e0;2018-02-22 20:18:42.21', pos=18052, indexname=_SYS_TREE
_CS_#150584_#0_#P0, rc=55" is sent to per@du.my
"Mini Check ID S0120 Description: SYSTEM user deactivated Value: no Expectation: yes C: X" is se
nt to lena@du.my
```




Run hanachecker “forever” with the –hci flag

Flag	Unit	Details	Explanation	Default
-hci	Days	hanachecker interval	After these number days hanachecker will restart	-1 (exits)

Example: HANAChecker runs here the mini-checks and sends emails once every day

```
mo-fc8d991e0:/tmp/HANAChecker> python hanachecker.py -mf HANA_Configuration_Minichecks_1.00.120+.txt -en chris@comp.com,smtp.intra.comp.com -M1170 peter@comp.com -hci 1

"Mini Check ID M1170   Description: Average database request time (ms)   Value: 6.91
Expectation: <= 2.00   C: X   SAPNote: 2000002" is sent to peter@comp.com
"Mini Check ID M1170   Description: Average database request time (ms)   Value: 6.91
Expectation: <= 2.00   C: X   SAPNote: 2000002" is sent to peter@comp.com
"Mini Check ID M1170   Description: Average database request time (ms)   Value: 6.91
Expectation: <= 2.00   C: X   SAPNote: 2000002" is sent to peter@comp.com
```

Note: HANAChecker could ofcourse also be scheduled by a cron job – do then NOT use the -hci flag!



To control the output of the hanachecker there are these flags

Flag	Unit	Details	Explanation	Default
-od		output directory	full path of the folder where the hanachecker logs are written	/tmp/hanachecker_output
-so		standard out switch	1: write to std out, 0: do not write to std out	1

Example:

Here an output folder is deleted and then automatically created again by hanachecker and a new log file is written into it:

```
mo-fc8d991e0:/tmp/HANAChecker> rm -r /tmp/hanachecker_output/
mo-fc8d991e0:/tmp/HANAChecker> python hanachecker.py -mf HANA_Configuration_Minichecks_1.00.120+.txt -en chris@comp.com,smtp.intra.comp.com -M1170 peter@comp.com -so 0

mo-fc8d991e0:/tmp/HANAChecker>
mo-fc8d991e0:/tmp/HANAChecker> more ../hanachecker_output/hanacheckerlog_2018-03-05_12-37-00.txt
"Mini Check ID M1170   Description: Average database request time (ms)   Value: 6.91
Expectation: <= 2.00   C: X   SAPNote: 2000002" is sent to peter@comp.com
```

HANAChecker – Used To Only Log Checks



If the `-en` flag is not specified, HANAChecker can be used to simply write all potential critical mini-checks in the log file, without sending out emails:

```
python hanachecker.py -mf HANA_Configuration_MiniChecks_1.00.120+.txt  
-ca dummy@me.com -so 0
```

Example:

```
mo-fc8d991e0:/tmp/HANAChecker> rm -r /tmp/hanachecker_output/  
mo-fc8d991e0:/tmp/HANAChecker>  
mo-fc8d991e0:/tmp/HANAChecker> python hanachecker.py -mf HANA_Configuration_  
MiniChecks_1.00.120+.txt -ca lena@comp.com -so 0  
  
mo-fc8d991e0:/tmp/HANAChecker>  
mo-fc8d991e0:/tmp/HANAChecker> more ../hanachecker_output/hanacheckerlog_201  
8-03-05_12-40-31.txt  
"Mini Check ID M0012 Description: Revision level Value: 121.00 Expectatio  
n: >= 122.03 C: X SAPNote: 2021789"  
"Mini Check ID M0115 Description: Service startup time variation (s) Host:  
mo-fc8d991e0 Value: 3299447 Expectation: <= 600 C: X SAPNote: 2177064"  
"Mini Check ID M0209 Description: Recommended operating system kernel versi  
on Host: mo-fc8d991e0 Value: no (3.0.101-68-default instead of >= 0.108.7)  
Expectation: yes C: X SAPNote: 2235581"  
"Mini Check ID M0551 Description: Proper setup of timezone table TTZZ Valu  
e: no Expectation: yes C: X SAPNote: 1791342"
```

...

Monitoring HANAChecker – MDC (1/2)

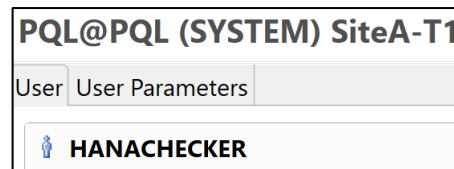
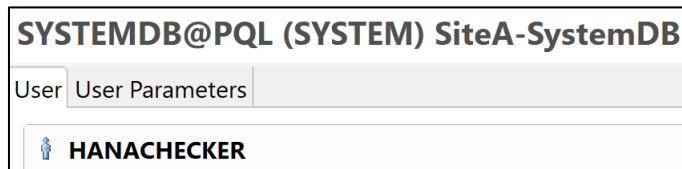


In a MDC system the hanachecker can check the SystemDB and multiple Tenants with one key

Maintain a user with same user name and same password in multiple DBs in one HANA System

Example:

Here the user HANACLEANER1 with same password was created in both SystemDB and in a Tenant



(for privileges,
see earlier slides)

Active	Host	Port	Service	SQL Port
■	atgls90010	30001	nameserver	30013
■	atgls90010	30010	compileserver	

Then only one key,
for the SystemDB,
was provided in
hdbuserstore

```
pqladm@atgls90010:/tmp> hdbuserstore LIST SDBCHECKERKEY  
KEY SDBCHECKERKEY  
ENV : atgls90010:30013  
USER: HANACHECKER
```

Test that this single
key can be used to
access both databases:

```
pqladm@atgls90010:/tmp> hdbsql -j -A -x -U SDBCHECKERKEY -d SYSTEMDB "select * from m_database"  
| SYS | DATABASE | HOST | START_TIME | VERSION | USAG |  
| --- | --- | --- | --- | --- | --- |  
| PQL | SYSTEMDB | atgls90010 | 2018-11-29 13:01:39.336000000 | 2.00.034.00.1539746999 | TEST |  
pqladm@atgls90010:/tmp>  
pqladm@atgls90010:/tmp> hdbsql -j -A -x -U SDBCHECKERKEY -d PQL "select * from m_database"  
| SYS | DAT | HOST | START_TIME | VERSION | USAG |  
| --- | --- | --- | --- | --- | --- |  
| PQL | PQL | atgls90010 | 2018-11-29 13:01:50.309000000 | 2.00.034.00.1539746999 | TEST |
```



In a MDC system the hanachecker can check the SystemDB and multiple Tenants with one key

Flag	Unit	Details	Explanation	Default
-dbs		DB key(s)	this can be a list of databases accessed from the system defined by -k (-k can only be one key if -dbs is used)	"

Example:

Here the key SDBCHECKERKEY is used to access the system, then it is specified with -dbs that two databases, SYSTEMDB and PQL, will be checked:

```
pqladm@atgls90010:/tmp/HANAChecker> python hanachecker.py -zf SQLStatements.zip -ct M -M1142 chris@du.my,lena@du.my -M1150 per@du.my,lena@du.my -as true -oe true -k SDBCHECKERKEY -dbs SYSTEMDB,PQL
"HANACecker was executed 2019-01-23 09:13:50 on SYSTEMDB@PQL with
hanachecker.py -zf SQLStatements.zip -ct M -M1142 chris@du.my,lena@du.my -M1150 per@du.my,lena@du.my -as true -oe true -k SDBCHECKERKEY -dbs SYSTEMDB,PQL
If any of the mini-checks that you are responsible for seem critical, you will be notified now.
Mini Check ID M1142 Description: Table(s) using > 10 % of SQL cache Host: atgls90010 Value: 1 Expectation: 0 C: X SAPNote: 2124112
```

```
"HANACecker was executed 2019-01-23 09:41:15 on PQL@PQL with
hanachecker.py -zf SQLStatements.zip -ct M -M1142 chris@du.my,lena@du.my -M1150 per@du.my,lena@du.my -as true -oe true -k SDBCHECKERKEY -dbs SYSTEMDB,PQL
If any of the mini-checks that you are responsible for seem critical, you will be notified now.
Mini Check ID M1142 Description: Table(s) using > 10 % of SQL cache Host: atgls90010 Value: 1 Expectation: 0 C: X SAPNote: 2124112
```




HANAChecker can be controlled with a configuration file
(additional flags given will overwrite flags in the configuration file)

Flag	Unit	Details	Explanation	Default
-ff		flag file	full path to the configuration file	

Example:

```
mo-fc8d991e0:/tmp/HANAChecker> more hanachecker_configurationfile.txt
Comp's HANA CHECKER Configuration File:

-mf HANA_Configuration_MiniChecks_1.00.120+.txt,HANA_Security_MiniChecks.txt
-en chris@comp.com,smtp.intra.comp.com
-cg M1140-M1145,peter@comp.com,M1146-M1150,sara@comp.com
-M1142 lena@comp.com,per@comp.com
-S0120 chris@ourcompany.com
-so 0

mo-fc8d991e0:/tmp/HANAChecker> rm -r ../hanachecker_output/
mo-fc8d991e0:/tmp/HANAChecker> python hanachecker.py -ff hanachecker_configur
ationfile.txt
mo-fc8d991e0:/tmp/HANAChecker> more ../hanachecker_output/hanacheckerlog_2018
-03-05_12-54-16.txt
"Mini Check ID M1142 Description: Table(s) using > 10 % of SQL cache Host:
mo-fc8d991e0 Value: 2 Expectation: 0 C: X SAPNote: 2124112" is sent to pe
ter@comp.com
```

...



Emails were retrieved from HANAChecker for potential critical mini-checks:

The screenshot shows an Outlook interface with three emails from HANAChecker. The third email is highlighted with a blue border.

Email 1: HANAChecker: A Potential Critical Mini-Check [redacted] - Message (Plain Text) (Read-O...
Mo 10:20
HANAChecker: A Potential Critical Mini-Check [redacted]!
Mini Check ID 1170 Description: Average database request time (ms) Host: Value: 6.91
Expectation: <= 2.00 Potential Critical: X SAP Note: 2000002

Email 2: HANAChecker: A Potential Critical Mini-Check [redacted] - Message (Plain Text) (Read-O...
Mo 10:20
HANAChecker: A Potential Critical Mini-Check [redacted]!
Mini Check ID 750 Description: Stat. server tables with retention < 42 days Host: Value: 14
Expectation: 0 Potential Critical: X SAP Note: 2147247

Email 3 (highlighted): HANAChecker: A Potential Critical Mini-Check [redacted] - Message (Plain Text) (Read-...
Mo 10:20
HANAChecker: A Potential Critical Mini-Check [redacted]!
Mini Check ID 2113 Description: Last global table consistency check (days) Host: Value: never
Expectation: <= 32.00 Potential Critical: X SAP Note: 2116157