Manual PLMN search trigger by Policyman because of Auto Learn timer expired

[Feature Background]

Sometimes we can see UE is in manual search state, but actually AP do not set PLMN search then it may be triggered by policyman.

PM triggers manual plmn scan periodically after coming to online and update mdb with new bands found.
New learned bands will be added to mcc2bands when lower layers report them. By triggering a plmn scan, forcing lower layers to search all available systems in the area. This ensures that MDB is up to date with all available bands.

[Feature Configuration]

Auto learn feature consists of two EFS files. One is auto_learn_time and one is net_scan_time. EFS folder is /mmcp/policyman/configurations.
"auto_learn_time" has two configurable times, a one-time timer after moving online and a periodic timer thereafter. Both values are set to 25 hours by default.

"net_scan_time" controls the first retry time and the retry time increase value since the complete scan is likely to fail (due to higher priority activity). Max retry time is fixed by 3. For example, first retry time is 35s, retry time increase value is 10s, then PM retry net scan with interval 35s, 45s, 55s if failed.

[Example Log]

// TIMER_AUTO_LEARN_SCAN expired, PM trigger a manual net scan

02:28:14.376348   PM/HighFreq/High/PM   [policyman_timer.c   766] Process expired timer 1002

02:28:14.376521   MMODE/DEBUG/Low/CM   [cmdbg.c   2062] >>CM phcmd 10 : 30 : sub 0 : id 0 : type 0

02:28:14.377335   MMODE/STRM/High/CM   [cmregprx_c.c   3778] PM_MANUAL_SEARCH search priority 1

02:28:14.377394   MM/LowFreq/High/REG   [reg_state.c   2260] DS: SUB 0 =REG= CM_NETWORK_LIST_REQ list_search_type 0 RAT Enabled BM = 0x1200, BST BM = 0x1200

//First scan is failed due to REG_MM_PLMN_SEARCH_TIME_OUT

02:32:14.378042   MM/LowFreq/High/REG   [reg_state_manual_search.c   162] DS: SUB 0 =REG= MMR_PLMN_SEARCH_CNF network_selection_mode 1 plmn_search_result 1 service_search -1 TI 1

//start TIMER_NET_SCAN, first retry time is set as 35s

02:32:14.380862   PM/HighFreq/High/PM   [policyman_timer.c   449] Starting timer 1000 with duration 35 secs1

02:32:49.380953   PM/HighFreq/High/PM   [policyman_timer.c   766] Process expired timer 10001

// retry time increase value is 10, so next retry time is 45s if still failed

02:32:49.381084   PM/HighFreq/High/PM   [policyman_timer.c   211] timer id 1000 on subs 0 has new interval 45

//trigger net scan after retry timer expired and successful this time

02:32:49.381071   MMODE/DEBUG/Low/CM   [cmdbg.c   2062] >>CM phcmd 10 : 30 : sub 0 : id 0 : type 0

02:32:49.382201   MMODE/STRM/High/CM   [cmregprx_c.c   3778] PM_MANUAL_SEARCH search priority 1

02:35:04.869111   MM/LowFreq/High/REG   [reg_state_manual_search.c   162] DS: SUB 0 =REG= MMR_PLMN_SEARCH_CNF network_selection_mode 1 plmn_search_result 0 service_search -1 TI 2

[Q&A]

Q: How to disable the auto learn feature?

A: You can remove modem_proc/mmcp/policyman/configurations/auto_learn_time or set to 0.

Q: If we do not use mcc2bands, will net scan triggered?

A: The network scan is started when mcc2bands.mdb file is existing after auto learn time is expired.

Q: What is the usage of NV71524/nv/item_files/modem/mmode/get_net_auto_mode

A: NV71524 is used for device which include 1X. When NV71524 is 0, manual search req can be rejected when device is working on 1X.