ETWS (Earthquake and Tsunami Warning System) doesn't only use SMSCB, but also contains parts that ensure notification of all MS as quickly as possible. Specifically, this means

- there's a PACKET APPLICATION INFO message sent over PACCH to all MS with TBF established

This ticket is about implementing the required features in the PCU.

We need to

- receive the ETWS primary notification message from the BTS via the PCU interface
- construct the PACKET APPLICATION INFO message from it
- send it via PACCH to all MS in packet dedicated mode

One interesting question is that the specs don't appear to describe how often this is to be re-transmitted (if at all). I suppose as we're not operating RLC/MAC in reliable mode, messages might get lost and they have to be re-transmitted? For how long? Do we also need to send it to MS who are establishing TBF at some later point? For how long?

Relevant sections of 44.060 are 8.1.7.2 (indicating its a PACKET APPLICATION INFORMATION message) and 11.2.47 for the actual structure of PACKET APPLICATION INFORMATION.

The sections about PCCCH / PACKET PAGING are not relevant.

So what we need to do is to

- transfer the complete (typically 56 bytes) of ETWS primary notification from BTS to PCU over PCUIF
- generate + send PACKET APPLICATION INFORMATION as per 11.2.47 to every MS that has a TBF established.

The specs are not clear if the message shall be sent once or multiple times. As we use RLC/MAC in confirmed (acknowledged) mode, I expect once is sufficient, as RLC/MAC would take care of retransmissions.
This compares to the situation on the CS side, where the ETWS primary notification is also sent only once over L3 through every dedicated channel (by the BSC), and LAPDm handles any retransmissions as needed.

as of https://gerrit.osmocom.org/c/osmo-bts/+/15420, osmo-bts passes the ETWS Primary Notification into the PCU. The task remaining is to actually build the PACKET APP INFO as per TS 11.2.47 and to iterate over all UE with active TBF and send that message to them.

Care should be taken that if possible, this message precedes any other data that we may have queued for the given MS. I'm not familiar with the inner details of how the queues for the MSs work, but I'm confident it must be possible to insert at beginning rather than append at the end somehow.

WIP branch: osmith/pcu-etws

https://gerrit.osmocom.org/c/osmo-pcu/+/15459