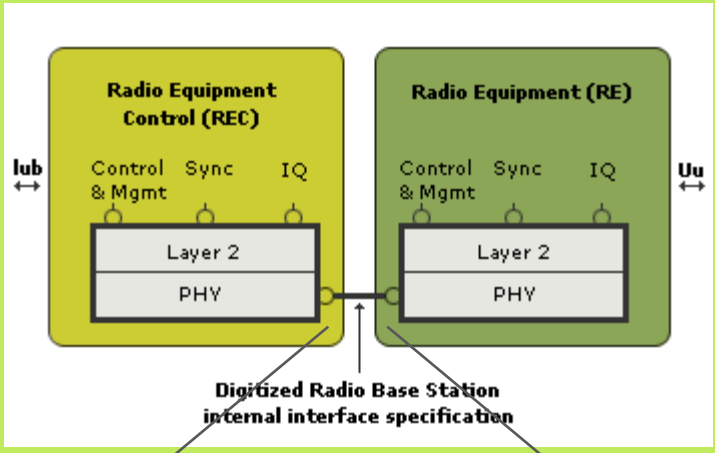
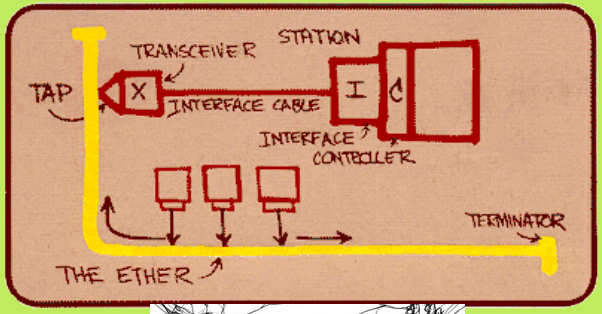
ERICSSON

CPRI OVER ETHERNET

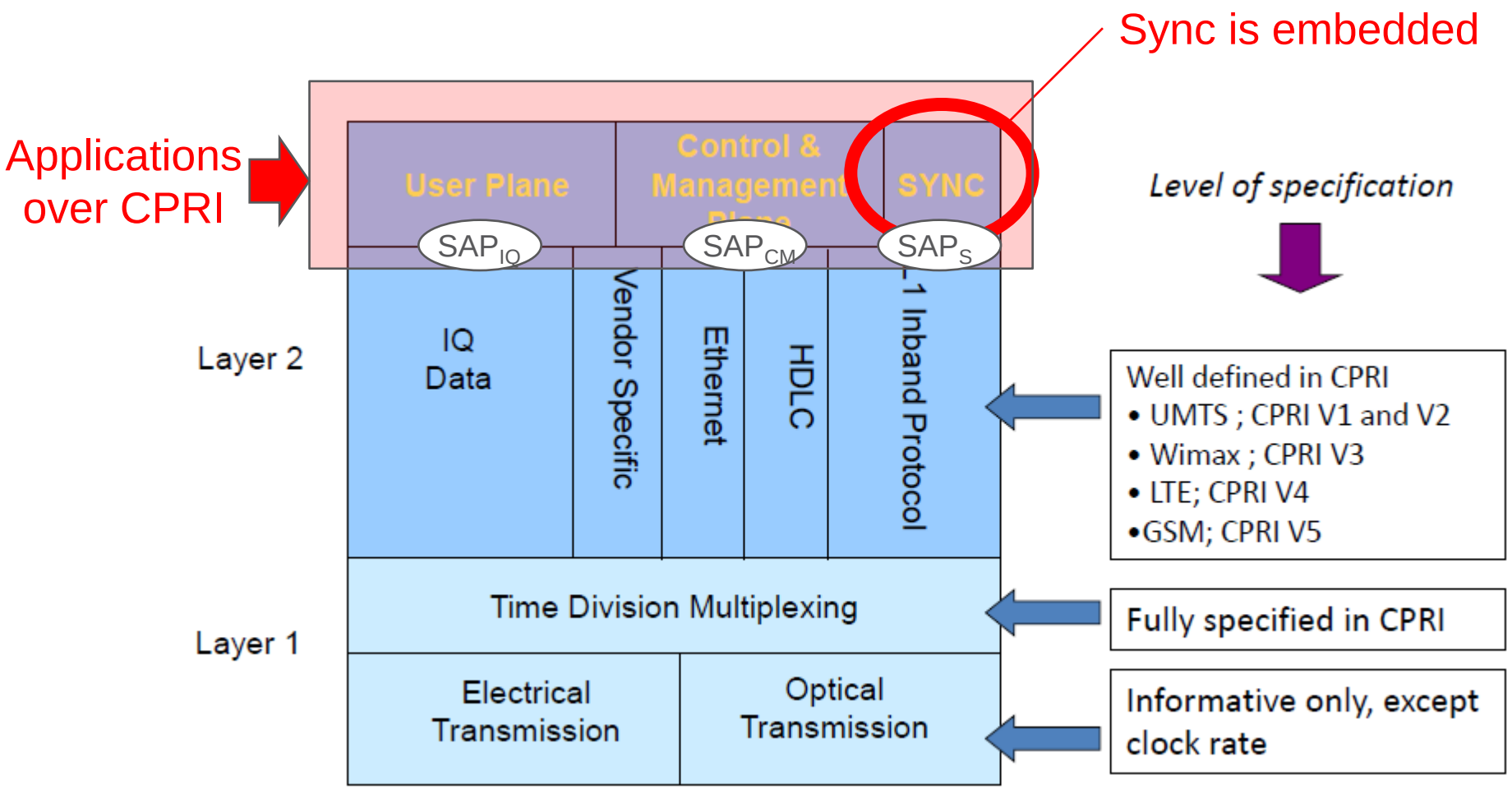
TOWARDS CPRI PARAMETERS





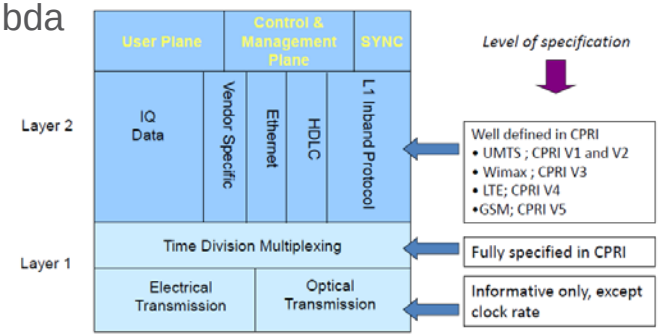
2015-11-11, IEEE P802.1CM, Dallas
Balázs Varga (A); balazs.a.varga@ericsson.com
János Farkas; janos.farkas@ericsson.com

CPRI COOPERATION
THE TRAFFIC



THE BIG JUMP
FROM DEDICATED TO SHARED

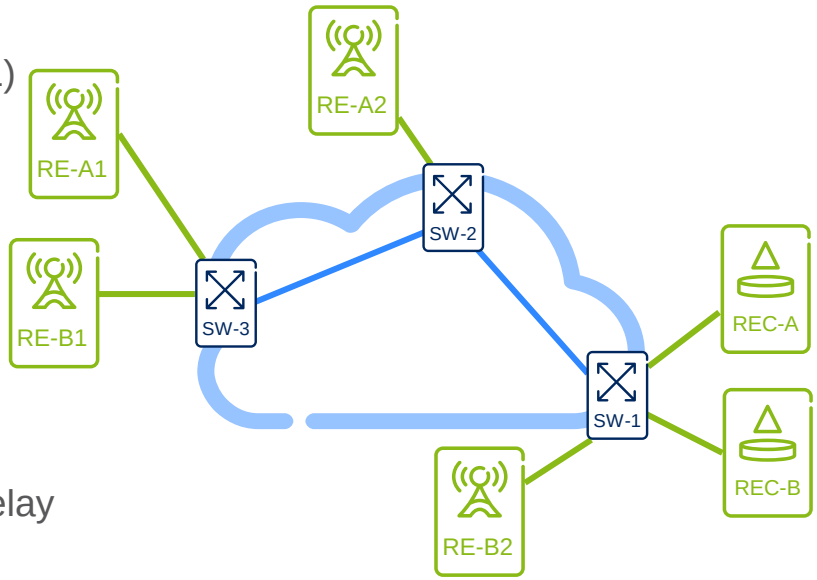
- Optical transport (dark fiber or lambda):
  - Dedicated media: therefore no impact of traffic in other link/lambda
  - Delay:
    - symmetric (if optical path managed)
    - constant (depends on fiber length)
  - Delay variation: n/a (it is a pipeline)
  - Errors: bit errors
  - SYNC: can travel with



- Packetized transport
  - Non-dedicated media: transport parameters impacted by statistical multiplexing
  - Delay:
    - asymmetric up/down (path may differ and actual traffic situation may influence delay)
    - inconstant – skew (delay may change by time; depends on e.g. load, type of traffic, etc.)
  - PDV: yes (impact of statistical multiplexing)
  - Errors:
    - loss of packets (caused by congestion, failures, etc.)
      solution: detect loss e.g. via sequence numbering
    - out-of-order delivery (caused by multiple paths, rerouting, etc.;)
      solution: single path + sequence numbering
  - SYNC: additional challenge

TRAFFIC PARAMETERS
WANTED ETH CHARACTERISTICS

- Transport parameters for CPRI to be specified
  - BW: based on CPRI specification (CPRI Spec v6.1)
  - Delay: ???-100 usec (e2e one-way)
  - PDV: ??? usec – nsec (packet delay variation)
  - Frame size: ??? Bytes
  - Packet loss: ???
  - Other CPRI specific parameters may apply
    - Symmetric delay (Up/Down)
    - Delay wander: change of average transport delay
    - ???



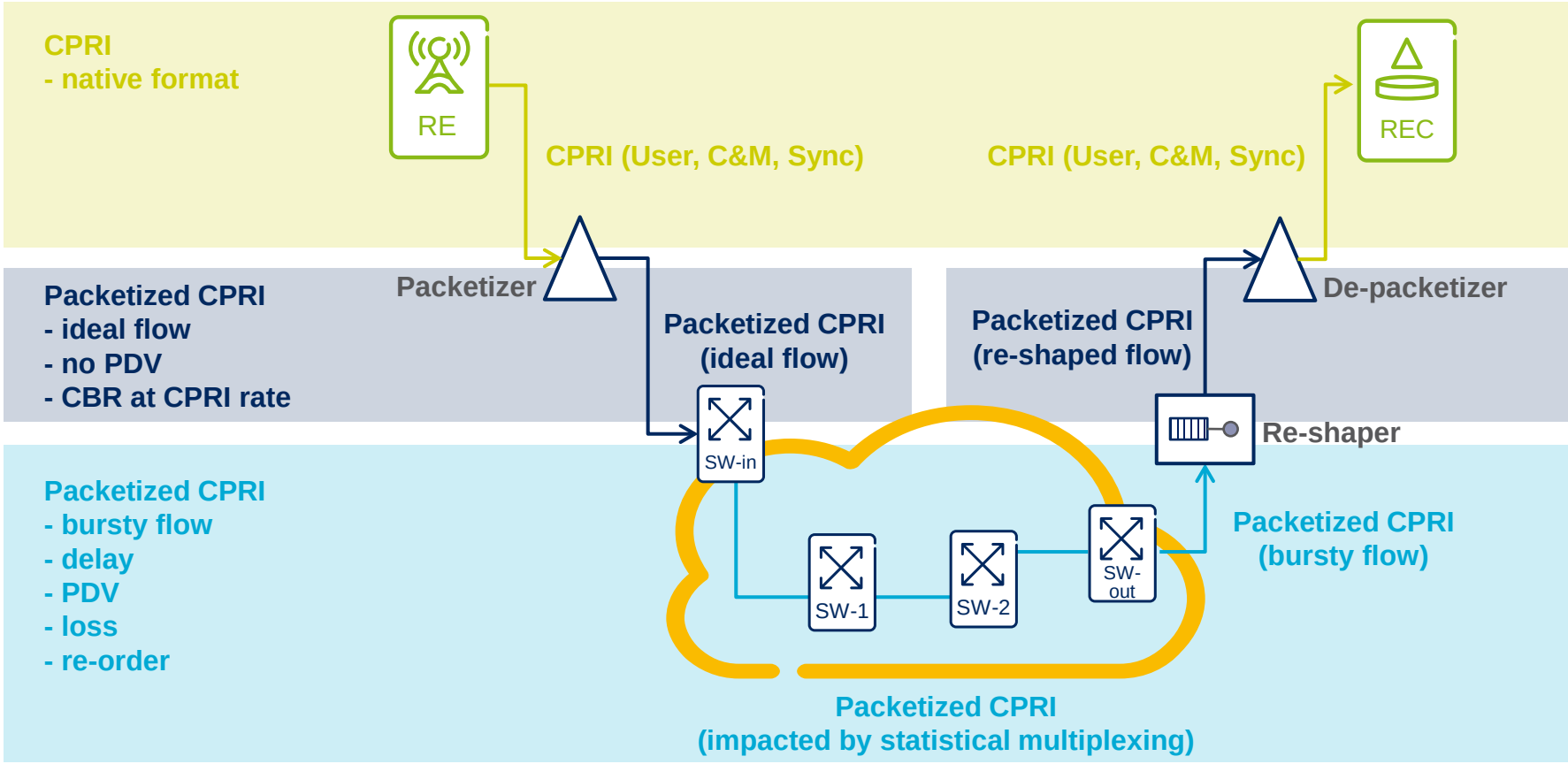
- Notes
  - Radio applications transported over CPRI might have different requirements (IQ frame transport, IQ-control, O&M traffic, Sync, etc.)
  - Radio Access Technology (RAT) dependent parameters (LTE-TDD, LTE-FDD, 3G, etc.)
  - SYNC solution can impact parameter value (In-band Sync vs. Out-of-band Sync)
  - Packet based Fronthaul may NOT be able to support some features/configurations
  - High CPRI traffic volume is to be expected compared to link speeds

TRAFFIC PARAMETERS
NOTES ON DELAY AND PDV

- Packet Delay Variation (PDV) definition:
  - PDV is defined as 2-point packet delay variation. As per ITU Y.1540 delay variation of an individual packet is naturally defined as the difference between the actual delay experienced by that packet and a nominal or reference delay. ITU Y.1540 6.4.2.1 and RFC 5481 using the minimum delay as reference. (Use of the average delay as the delay variation reference is depreciated.)

- Delay and PDV:
  - PDV can be compensated at the cost of additional delay

BUILDING BLOCKS
FUNCTIONAL END2END (E.G. RE→REC)



Note: many valid option how to combine functions in nodes
Note2: splitting SAPs (O&M, Sync, User-data) and carrying them separately over the packet network may impact functional building blocks significantly

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