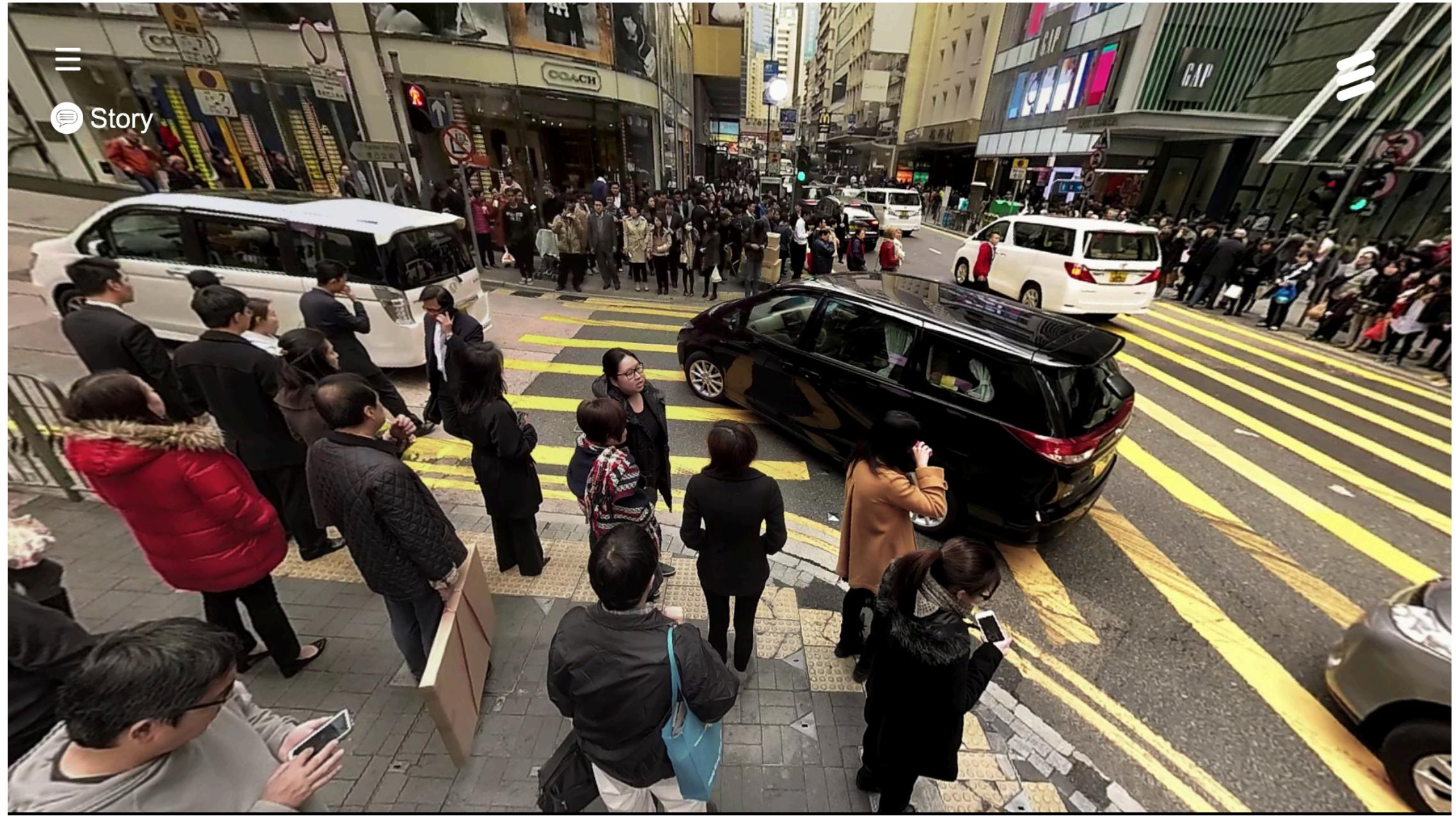




ERICSSON

# embedded erlang development

Erlang User Conference Stockholm 2015-06-12  
Anders Danne, Graham Crowe



≡



Story

≡



Story

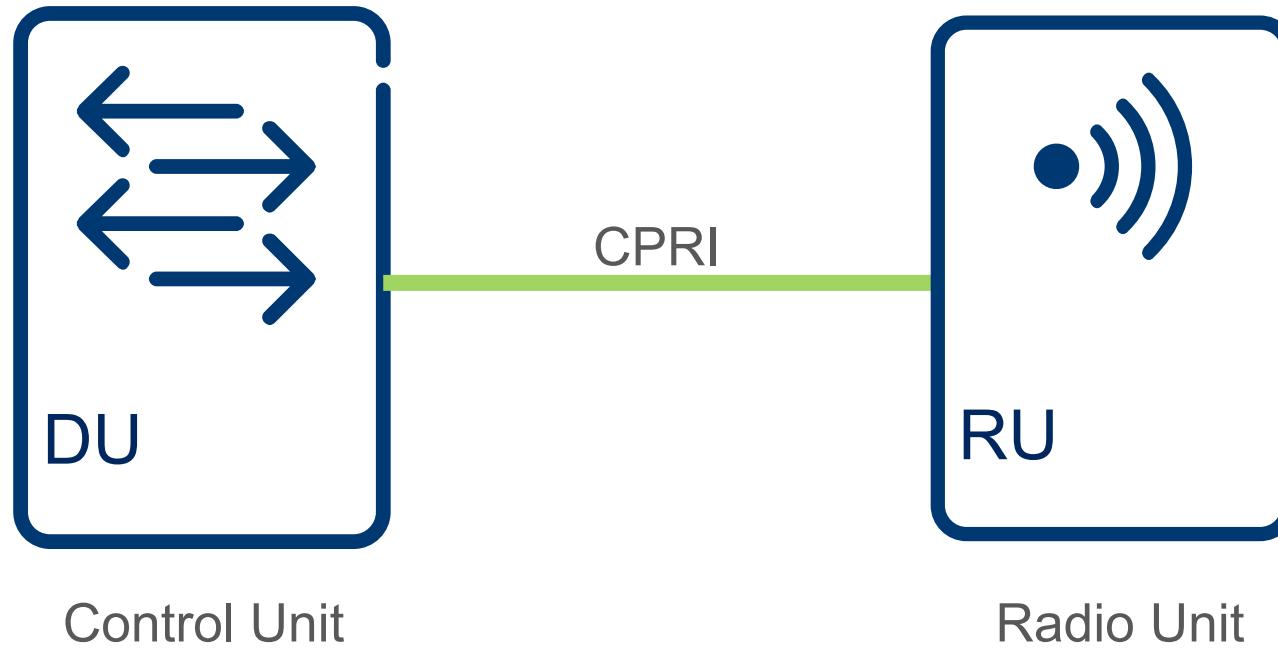
Install Radio



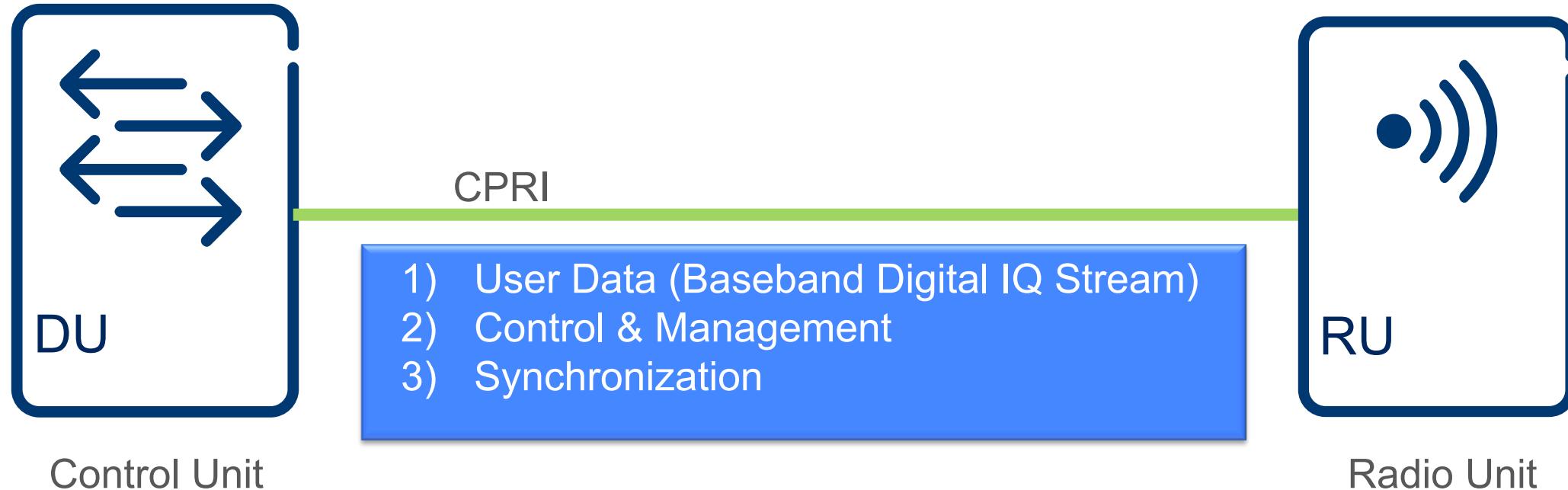




# Base station block schema

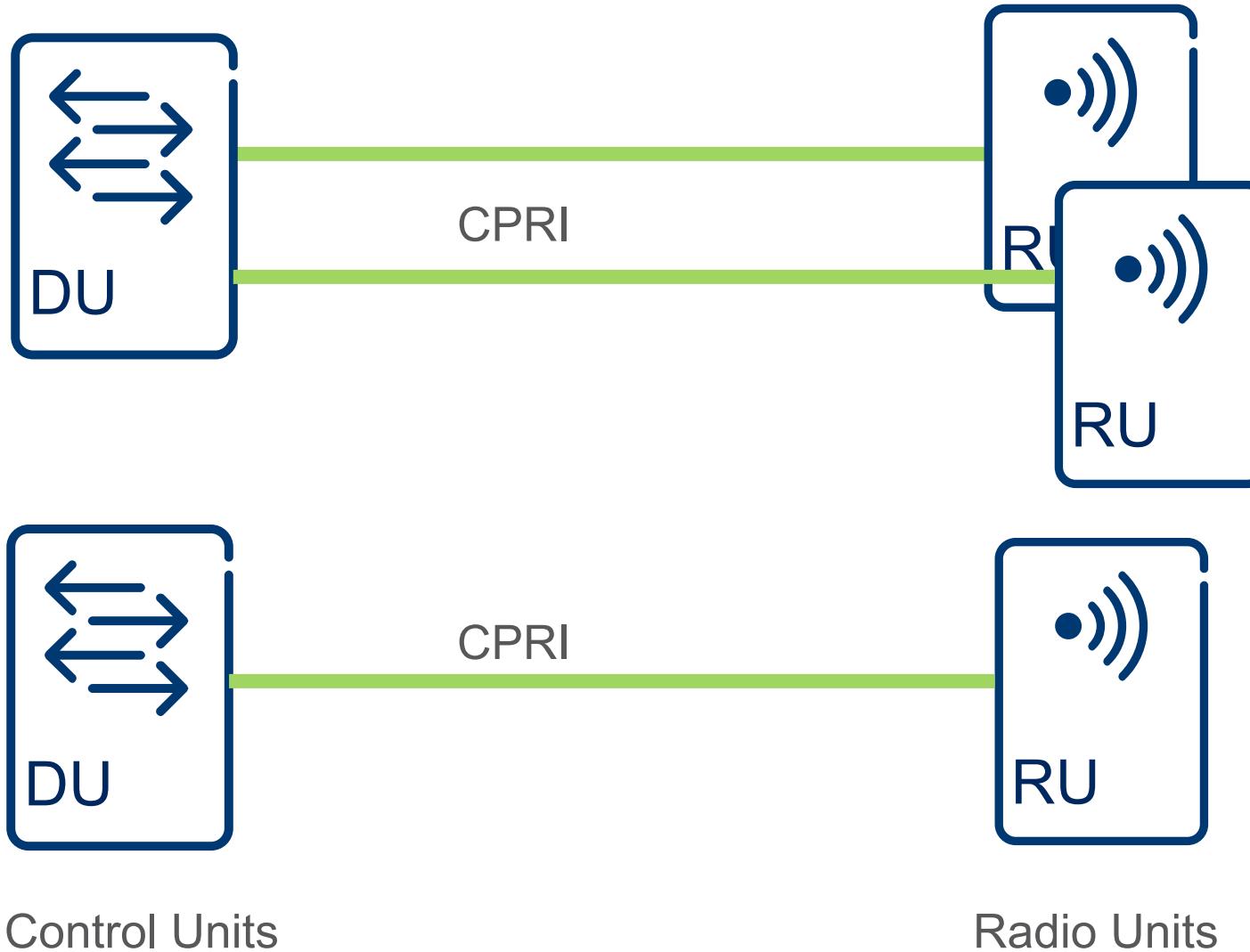


# cPRI – Common Public Radio interface



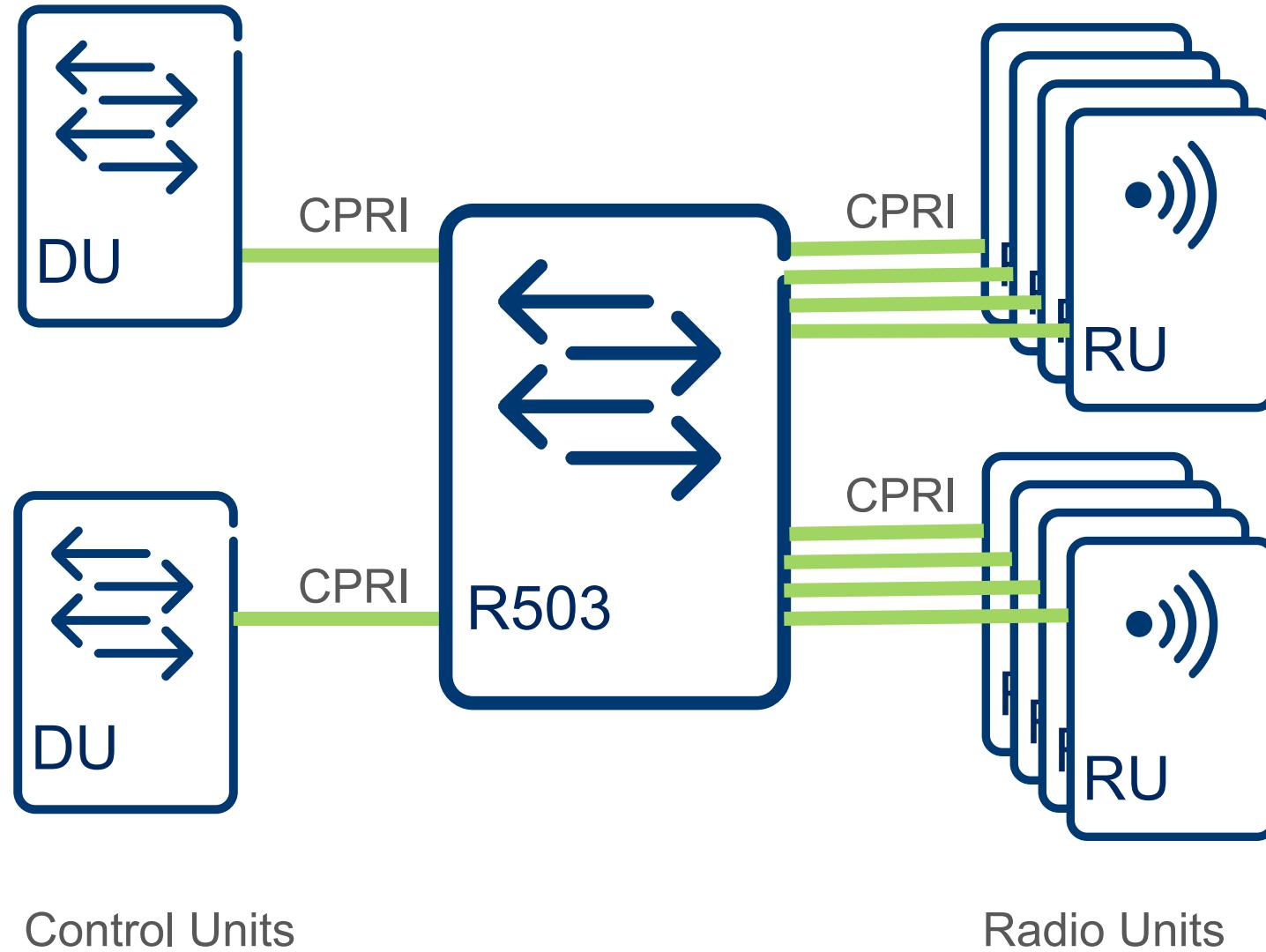


# Base station configurations





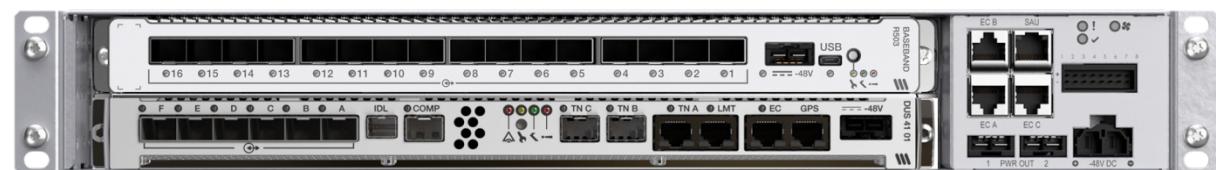
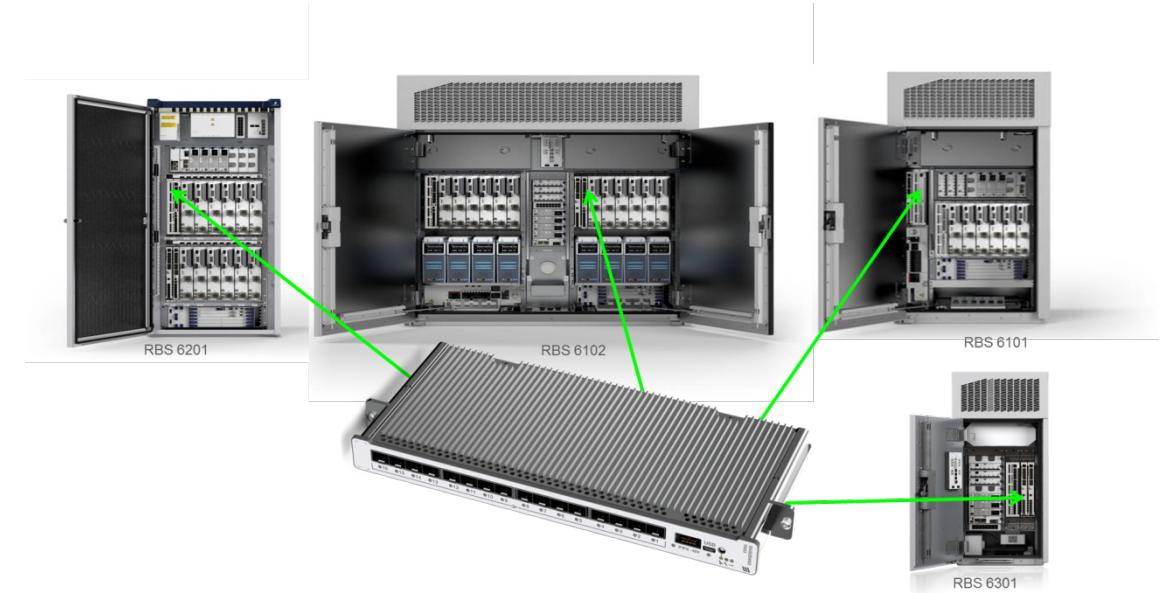
# More Flexible configurations



# Baseband R503



- › Increased connectivity for new & existing radio units in large radio system configurations
- › CPRI multiplexing and de-multiplexing
  - 16x SFP+ ports
    - › Pluggable optical transceivers
    - › Direct attach cables (electrical)



1989

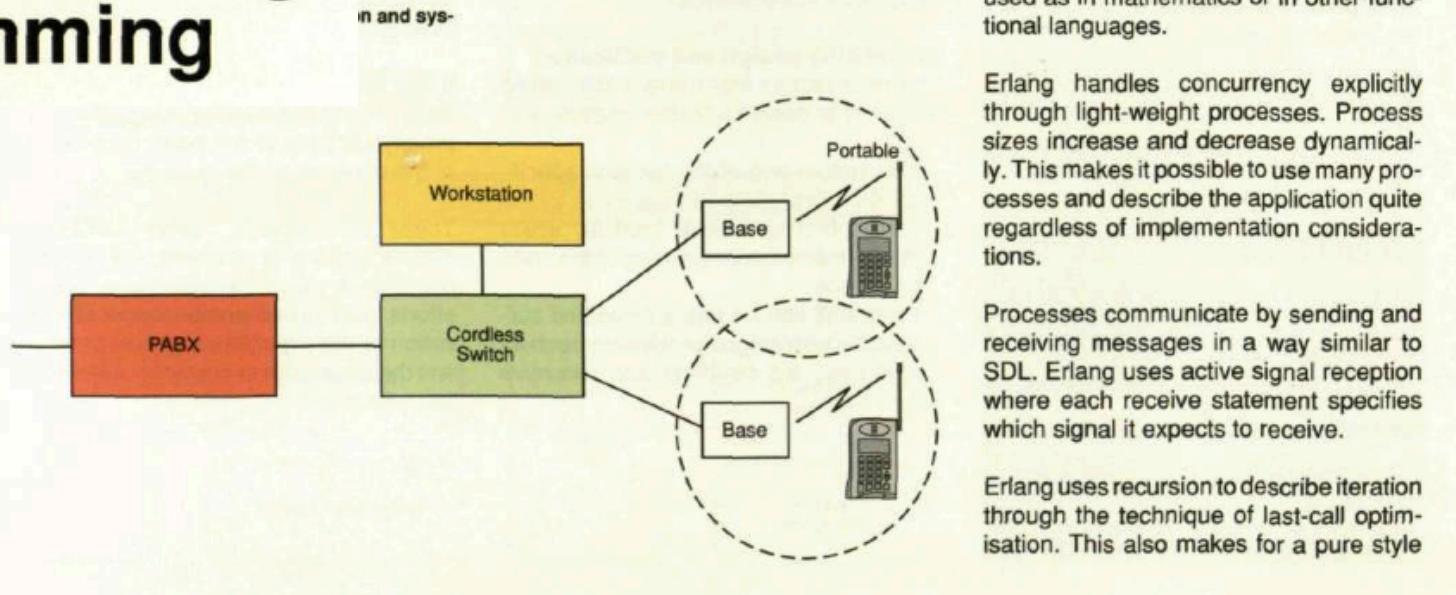


Joe, Robert, Mike

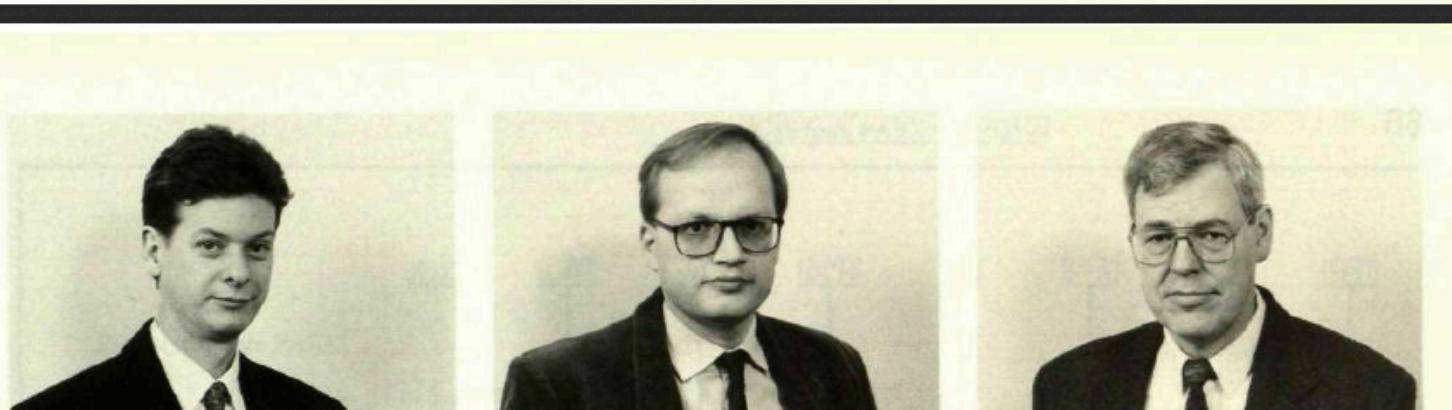


# Prototyping Cordless Using Declarative Programming

Erlang talk on ISS92  
in Yokohama



ERICSSON REVIEW No. 2, 1993



ANDERS DANNE  
JOHN-OLOF BAUNER  
Ericsson Radio Systems AB  
INGEMAR AHLBERG  
Ellemtel Utvecklings AB

of programming, as exemplified in the following function representing a process which holds a counter in a system:

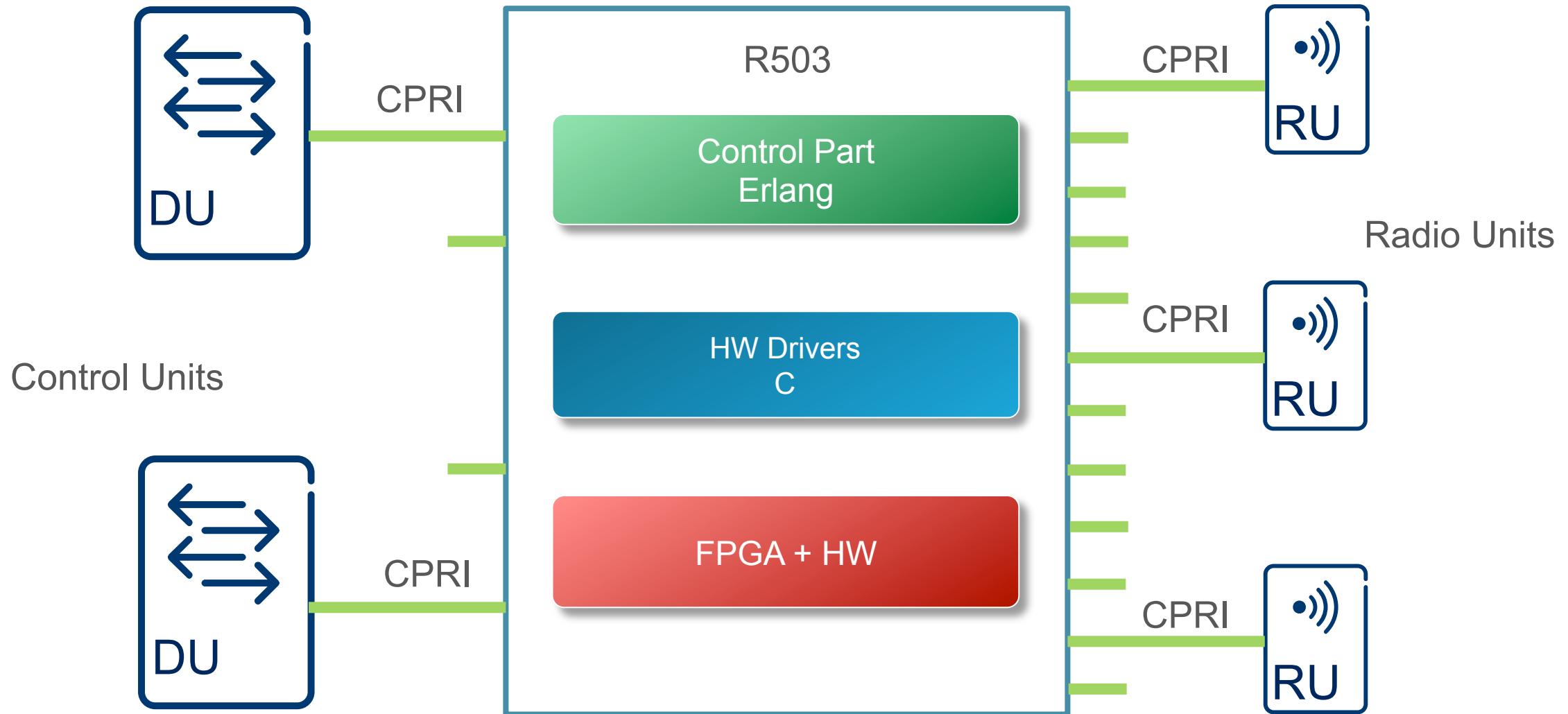
```
counter(N) ->  
    receive  
        {increment} -> counter(N + 1);
```

## The DCT900 radio exchange

The DCT900<sup>4</sup> system is similar to a DECT<sup>5</sup> system based on Multicarrier/Time Division Multiple Access/Time Division Duplex (MC/TDMA/TDD) technique. It is designed for a high density of users



## Baseband R503

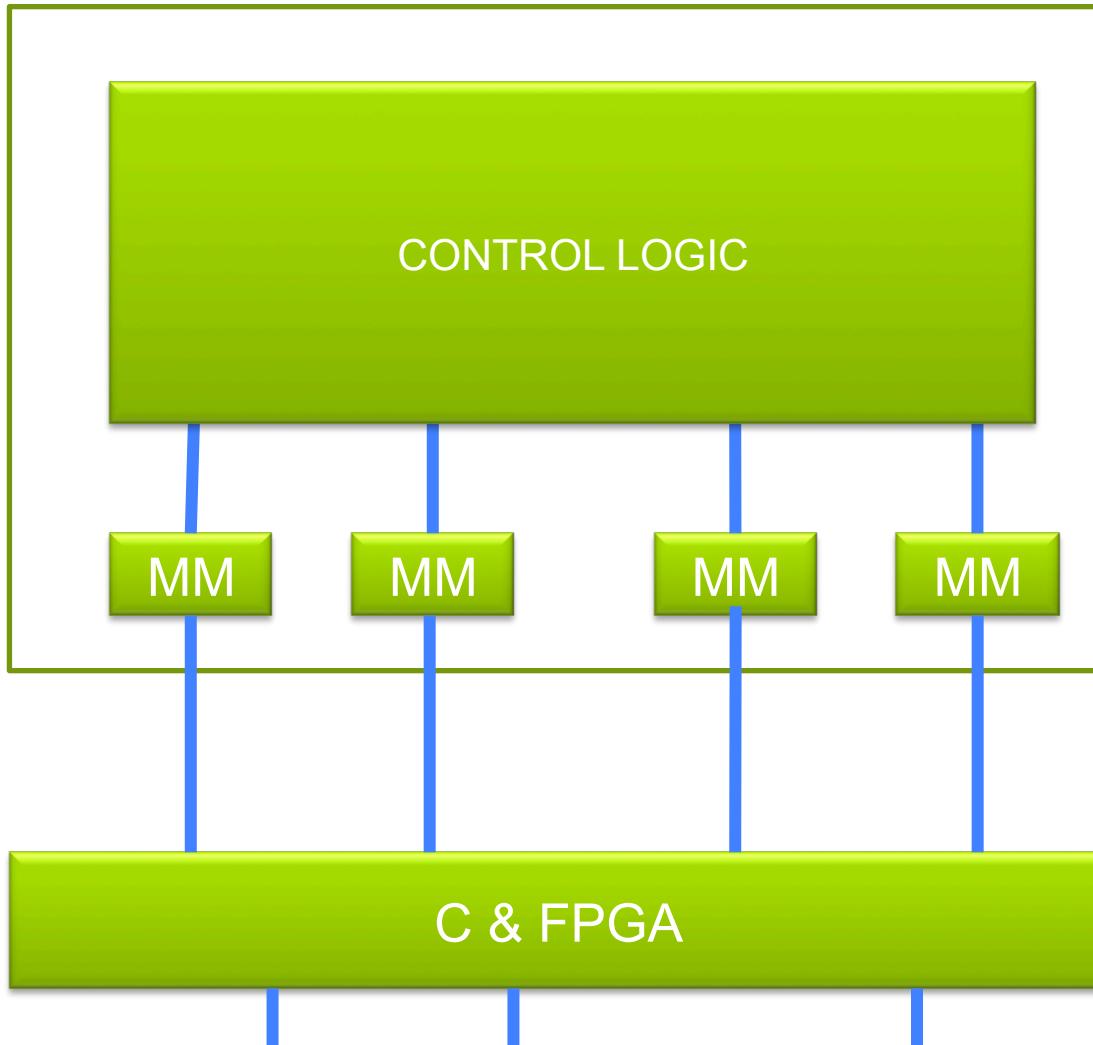


# MEMORY FOOTPRINT



- › Complete standard Erlang/OTP installation approx 150 Mbyte
- › Pick some of the OTP modules
- › Strip debug information from OTP
- › Now 6 Mbyte for Erlang
  - Application 1 Mbyte
  - Erlang/OTP 5 Mbyte

# Erlang CONTROL logic



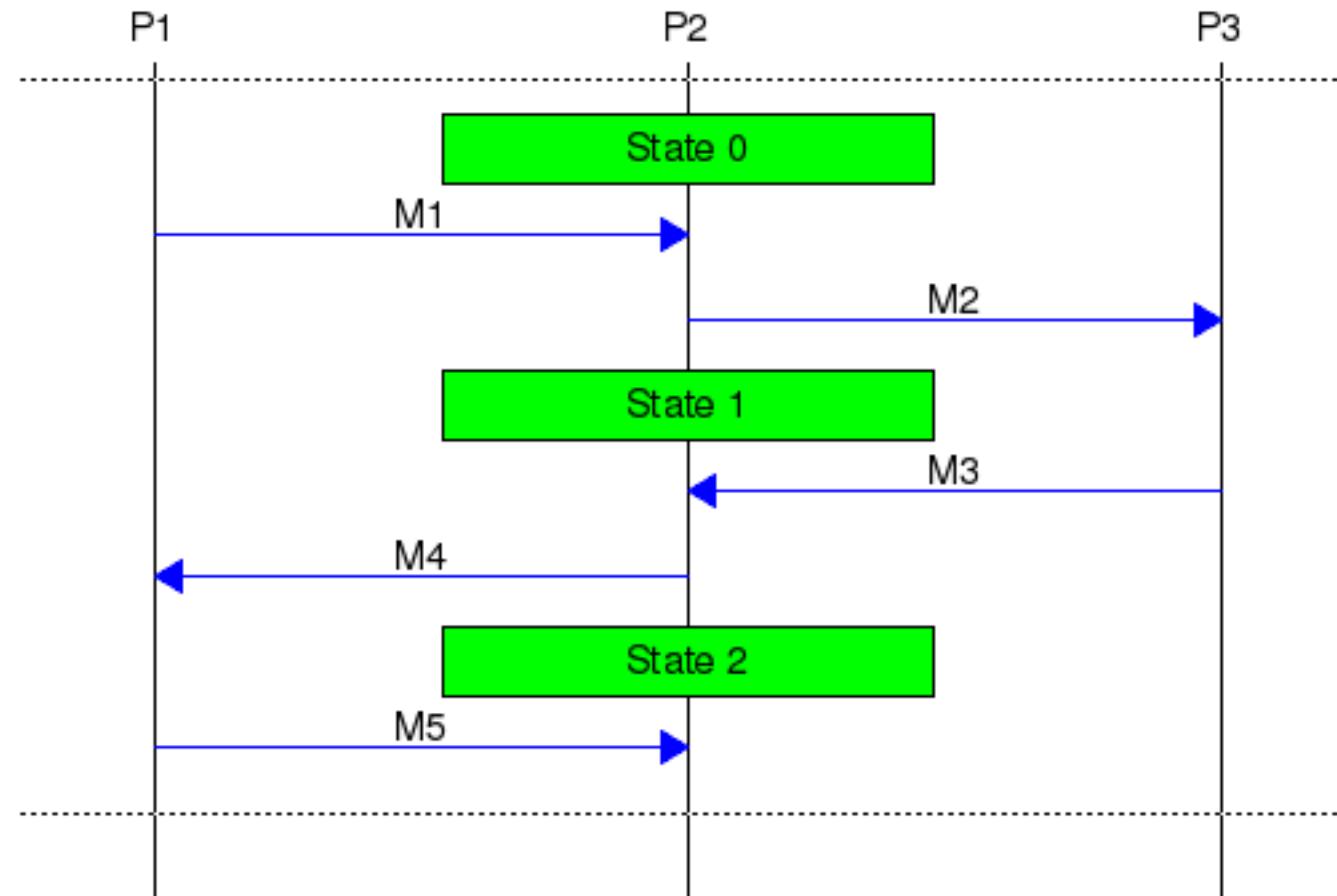
Control logic

Middle-man processes

- XML specifications
- Code generators

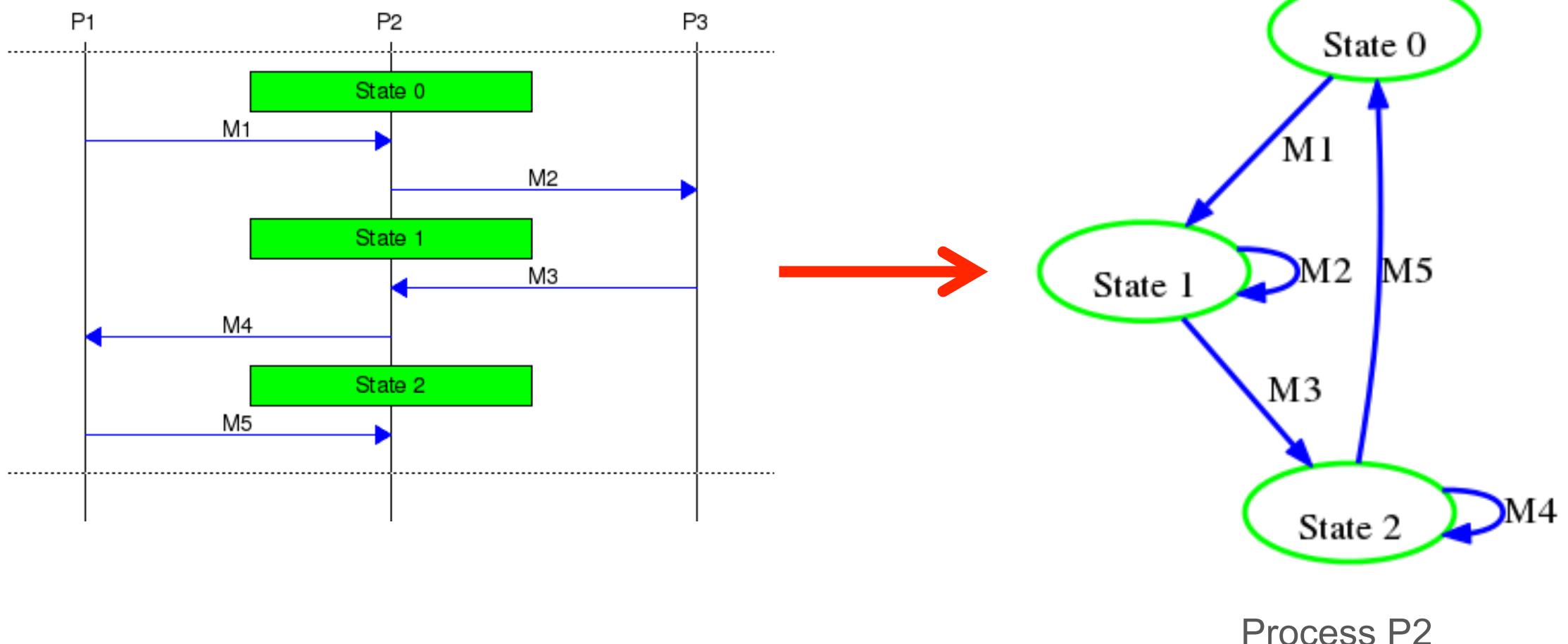


# Message sequences



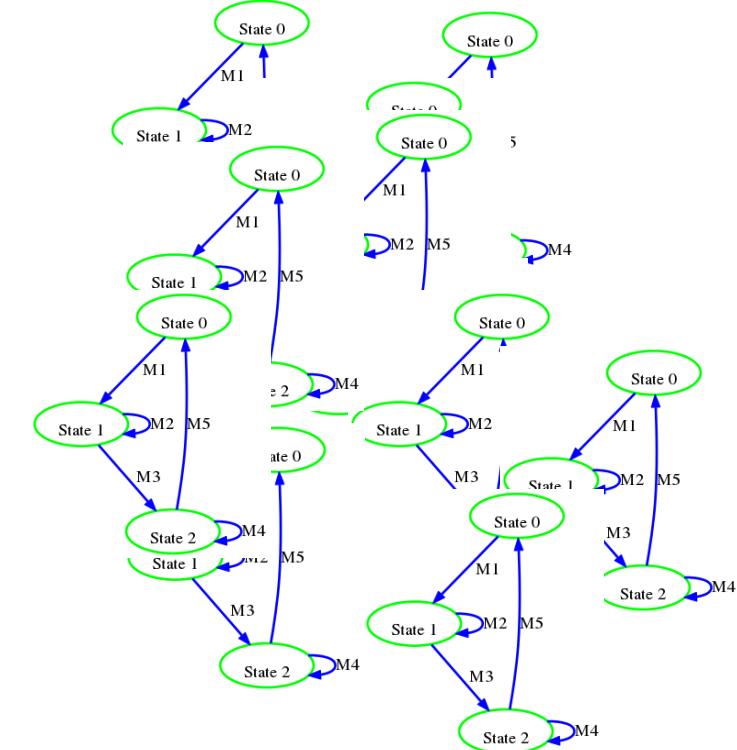
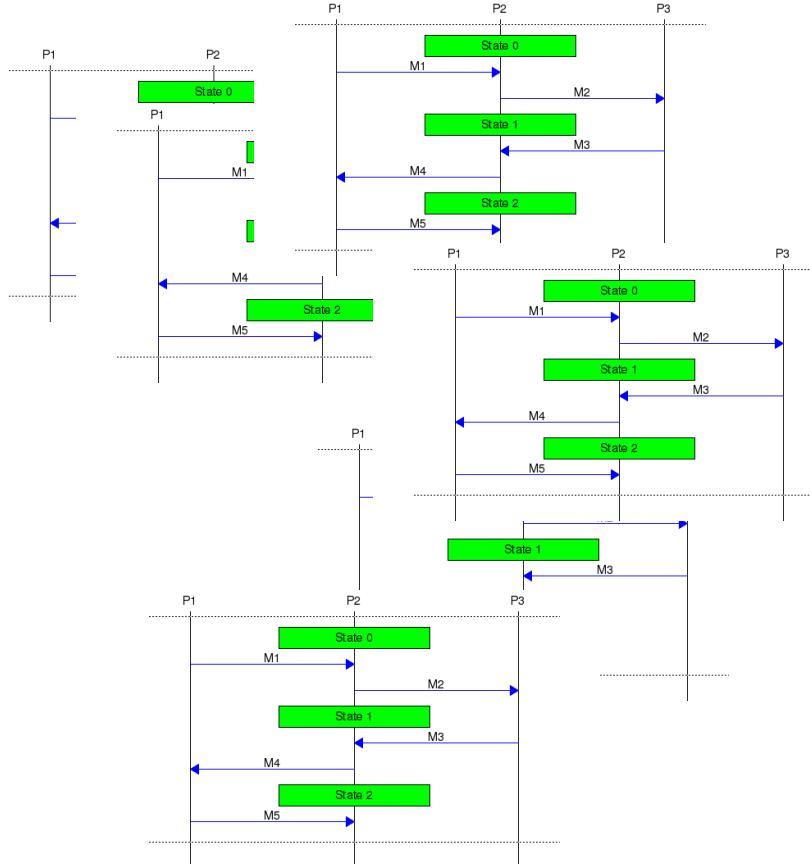


# Message sequence to state machine





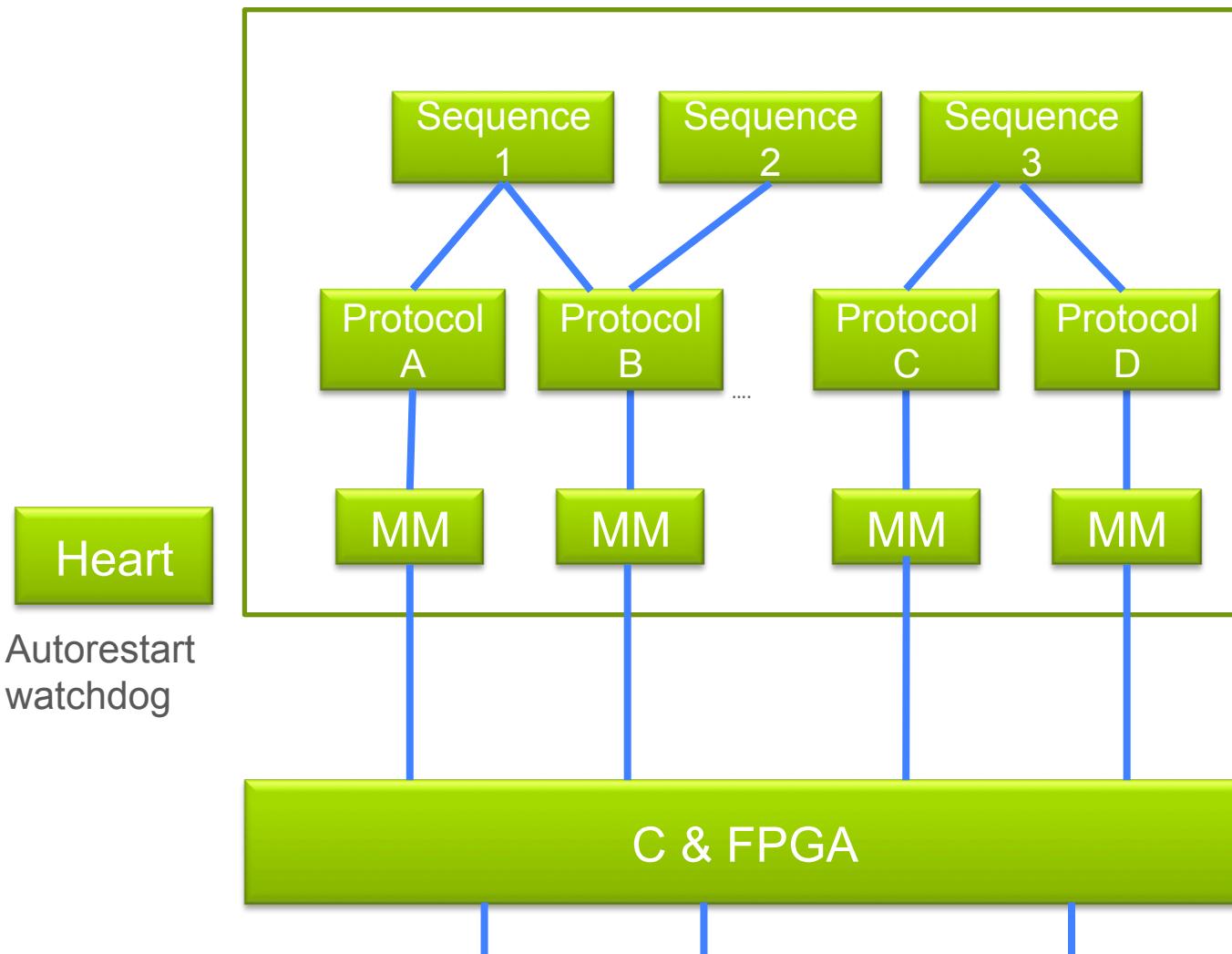
# Many sequences



Many sequences combined  
in process P2



# Erlang Process architecture



## Sequence handling processes

- CP-AP (Composite procedures and Atomic procedures)
- Feature interaction

## Non-blocking protocol processes

- Tail recursive

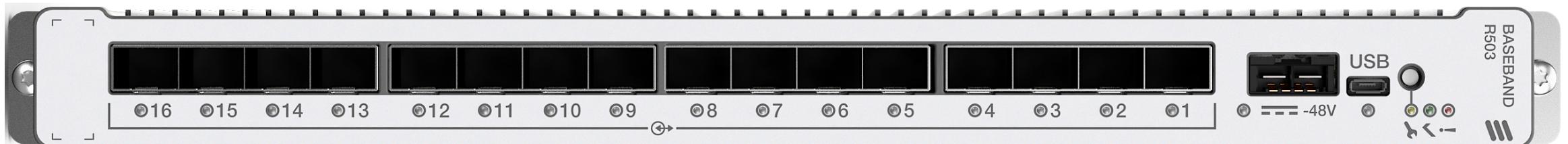
## Middle-man processes

- Encode/decode

# SUMMARY PART 1



- ✓ Erlang suitable for embedded
- ✓ High productivity
- ✓ SW Architecture
- ✓ Memory footprint
- ✓ Performance
- ✓ Quality





CONNECTING THE next  
5 billion