

Software deliveries and maintenance

Case: GSM networks

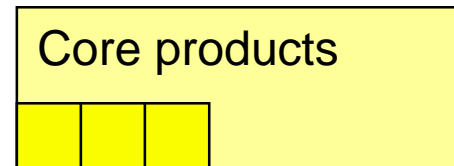
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Mobile Networks Supply and Support - Unit,
ERICSSON**

Contents of the presentation

- ✗ **Software development process**
- ✗ **Supply process**
- ✗ **Ericsson global supply and support organization**
- ✗ **Support and maintenance processes**
- ✗ **Questions**

Application Systems (AS)

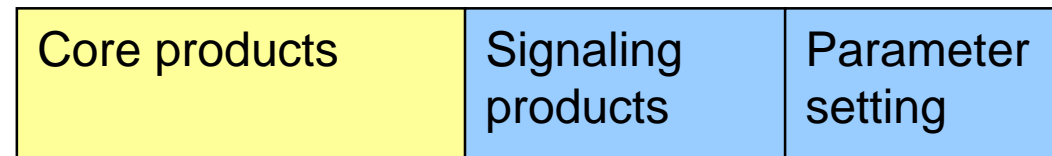
Global
Application
System (GAS)



- *Standard functionality*

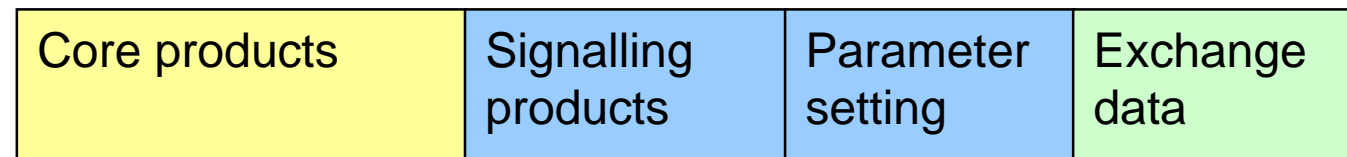
Functional blocks

Market
Application
System (MAS)



- *Per operator or country*

SW running
at the customer
site

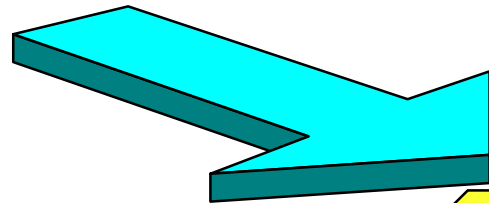


- *Per site*

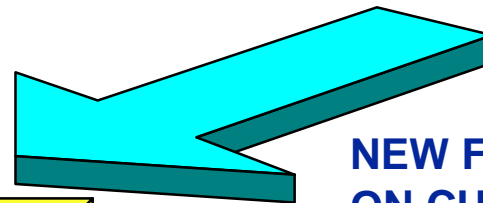
New major release of the SW is introduced...

- ✗ Approximately once per year for each network element
- ✗ The new SW release includes the following:

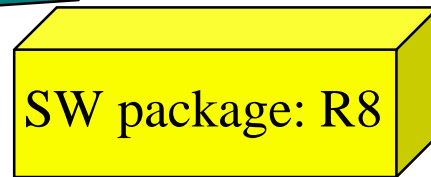
SW IMPROVEMENTS



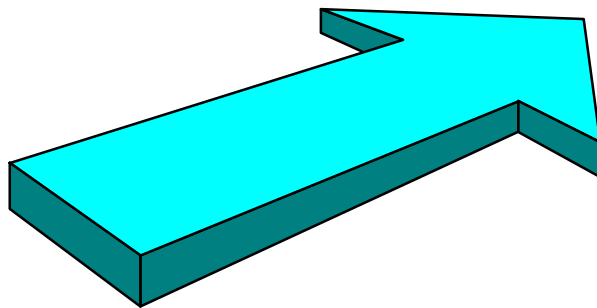
**NEW FEATURES BASED
ON CUSTOMER REQUIREMENTS**



SW package: R8



**NEW FEATURES SPECIFIED
BY THE GSM
STANDARDISATION BODY**



Different types of SW deliveries

✗ New software release (SW development process)

- “pilot customer”
- mass distribution after General Availability (GA)

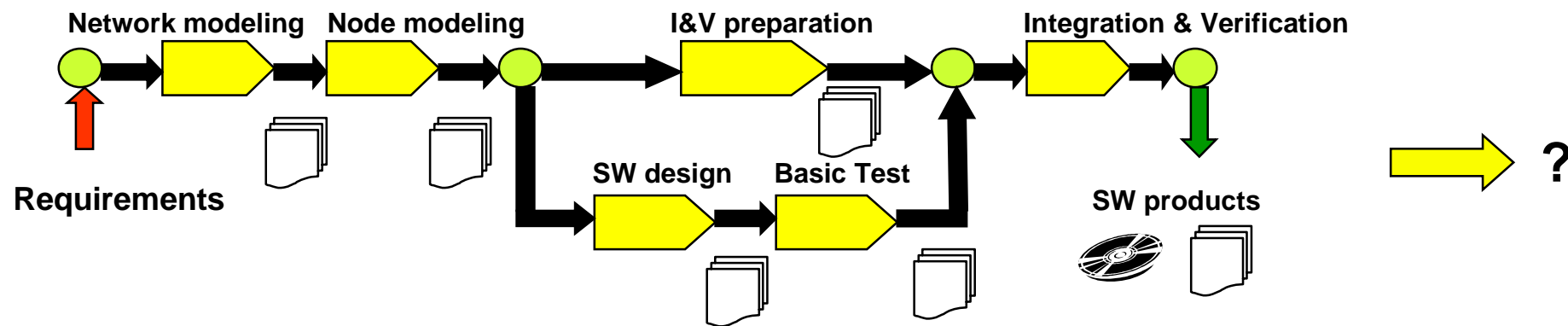
✗ Network expansion

- SW exists and no verification needed
- Network configuration changes with exchange data

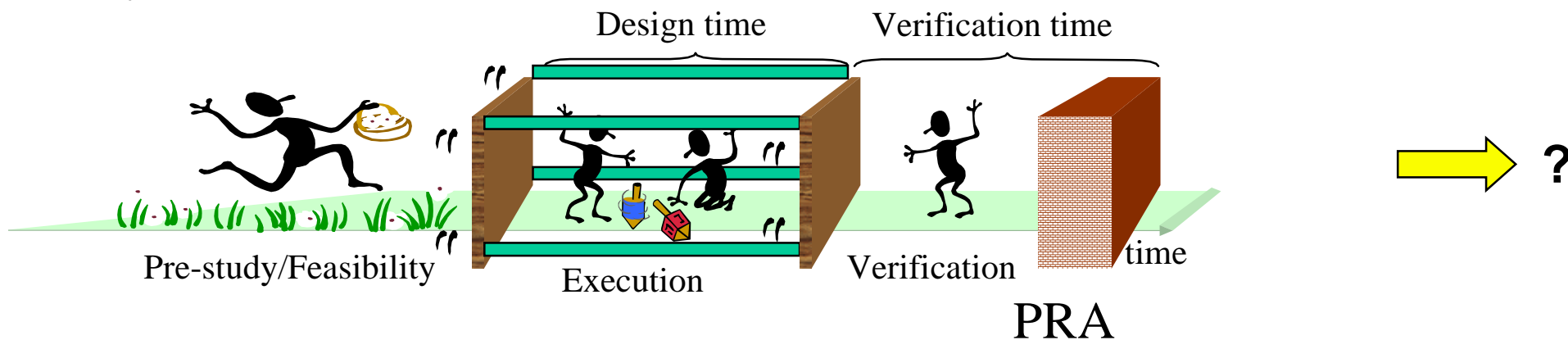
✗ New network/customer

Software development process

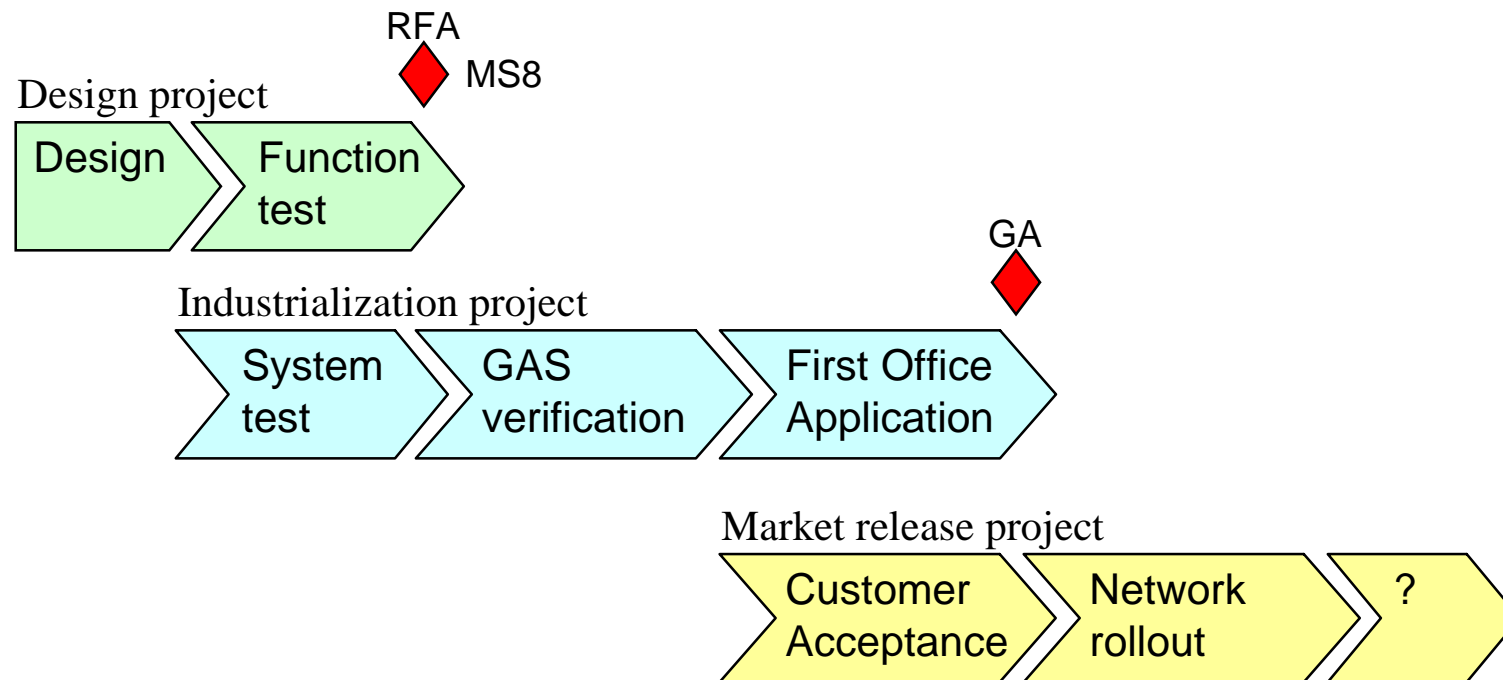
by Risto Kivioja:



by Kenneth Manner:



Software development process (pilot customer case)



Software development process - Industrialization

✗ **System test**

- negative test, load test, capacity test, ...

✗ **Global Application System (GAS) verification**

- to verify functionality on a network level

✗ **First Office Application (FOA)**

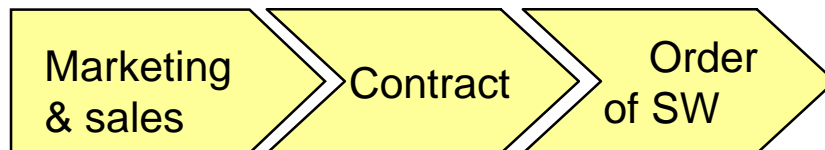
- “pilot customer”
- the first live implementation of the SW
- certain tests in a live network

✗ **General Availability (GA)**

- SW ready for mass production and deliveries

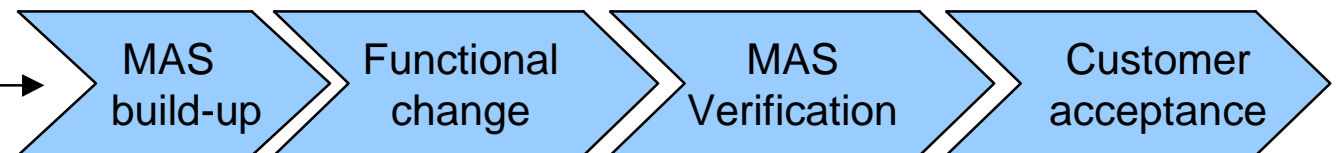
SW delivery flow (mass distribution case)

Marketing activities



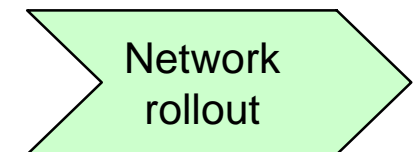
SW delivery activities

Verified Global
Application System
(GAS)

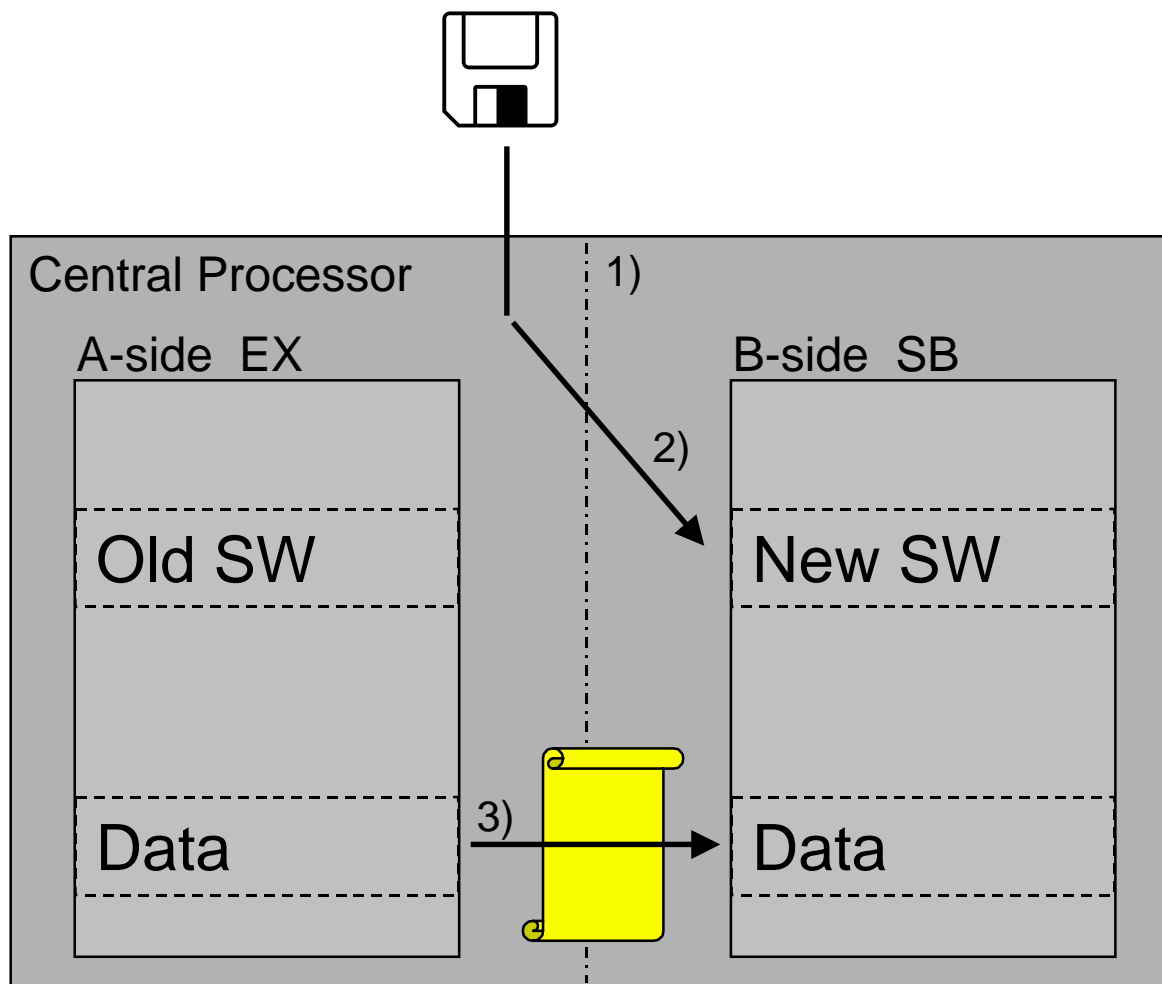


Network expansions

New exchanges



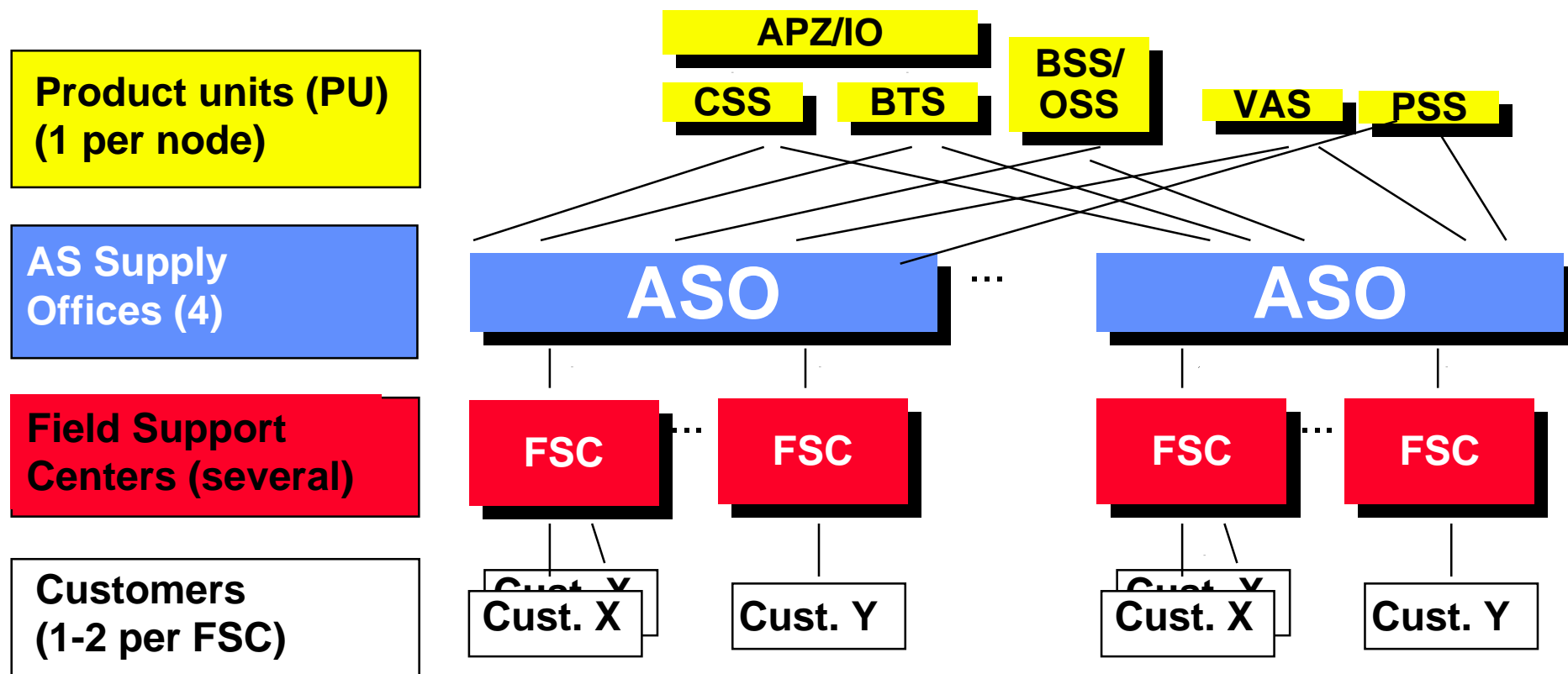
Function change method



- 1) Separate the EX- and SB-sides
- 2) Load the SW on SB-side
- 3) Transfer data from EX- to SB-side (data conversion)
- 4) Change B-side executive
- 5) Test the new SW
- 6) Run the sides parallel

Global supply and support organization

Product Design Centers all around the world



AS Supply Offices (ASO)



Dallas:
The Americas

Madrid:
Southern Europe,
Middle East and Africa

Jorvas:
Northern and Eastern
Europe incl. CIS

Melbourne:
Asia-Pacific

ASO product portfolio

- ✗ **Circuit switching products - MSC/VLR, HLR, ...**
- ✗ **Packet switching products - GPRS**
- ✗ **Base Station System - BSC, BTS**
- ✗ **Network management - OSS, ...**
- ✗ **Intelligent networks - Prepaid, VPN, ...**
- ✗ **Other products - SOG, BGW, VoIP, ...**
- ✗ **3G network elements - UMTS, ...**

The product portfolio covers GSM network products and also the next evolution phases following GSM

MAINTENANCE of the SW - SUPPORT of the customer!

✗ Maintenance of SW:

- preventive: correction handling
- corrective: trouble report handling

✗ Support of the operator:

- Support services: help desk, emergency support, consultation, spare part service

✗ The support chain

- 1st , 2nd and 3rd line support - follow the sun...

✗ A support case: Y2k ...

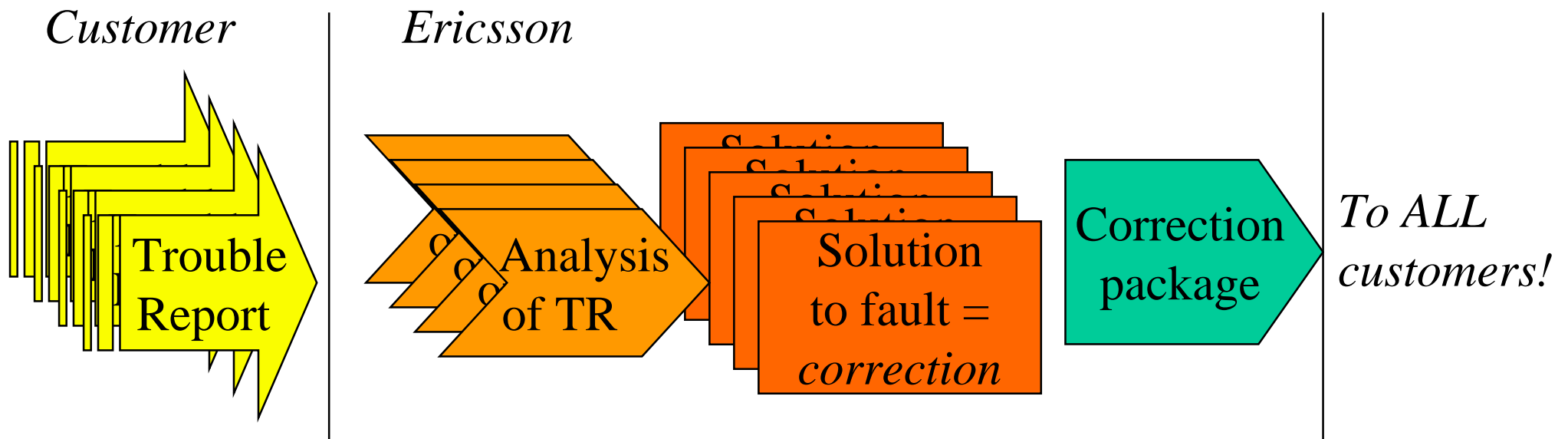
What is SW maintenance?

- ✗ **The quality assurance activities** (e.g. inspections of code and documentation, testing ...) **during the development phase aim at removing the faults as early as possible, latest before introducing the SW in a live network**
- ✗ **After delivery to the customer the SW maintenance is both PREVENTIVE and CORRECTIVE**
- ✗ **The goal of SW maintenance is to:**
 - to minimize "preventive maintenance" and to reduce "corrective maintenance", by systematic analysis of the SW in use
 - to keep the SW as UPDATED as possible during the SW's lifecycle



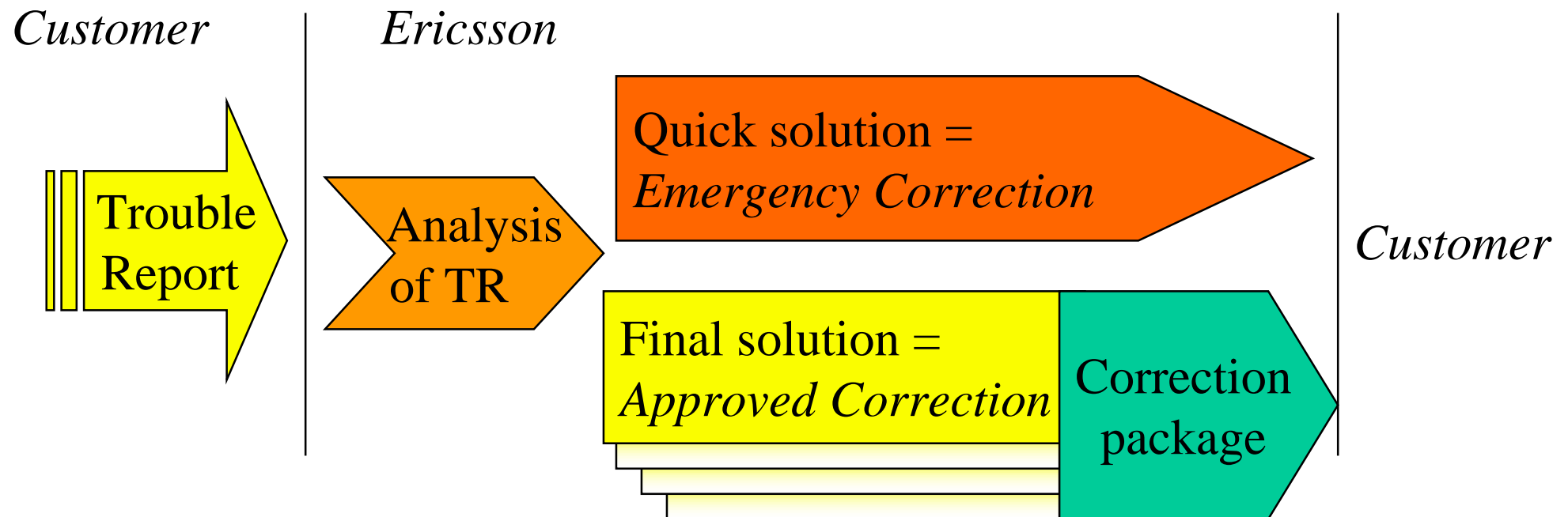
PREVENTIVE maintenance

- ✗ The goal of preventive maintenance is to secure that a solution to a problem of one customer is delivered to all customers with the same SW, and thereby prevent the appearance of that fault anywhere else.
- ✗ This is the generic flow of correction handling:



CORRECTIVE maintenance

- ✗ The goal of corrective maintenance is to quickly find a solution to the problem reported by the customer - the solution or correction should be maintainable.
- ✗ This is the generic flow of trouble report handling:



Support of the operator

- ✗ *The operator usually receives support in Operation & Maintenance issues according to the **Service Contract** made with the network supplier. The level of service varies depending on the content of the contract.*

*Here are some examples of typical **support services**:*

- ✗ **Help desk**

- takes care of all incoming questions from the customer
- usually maintained at the 1st line support organisation
- registers all contacts (phone calls, mail, etc.) and follows that the questions are being answered in a timely manner

- ✗ **Emergency support**

- usually 24h support in emergency situations, such as complete exchange failure etc.



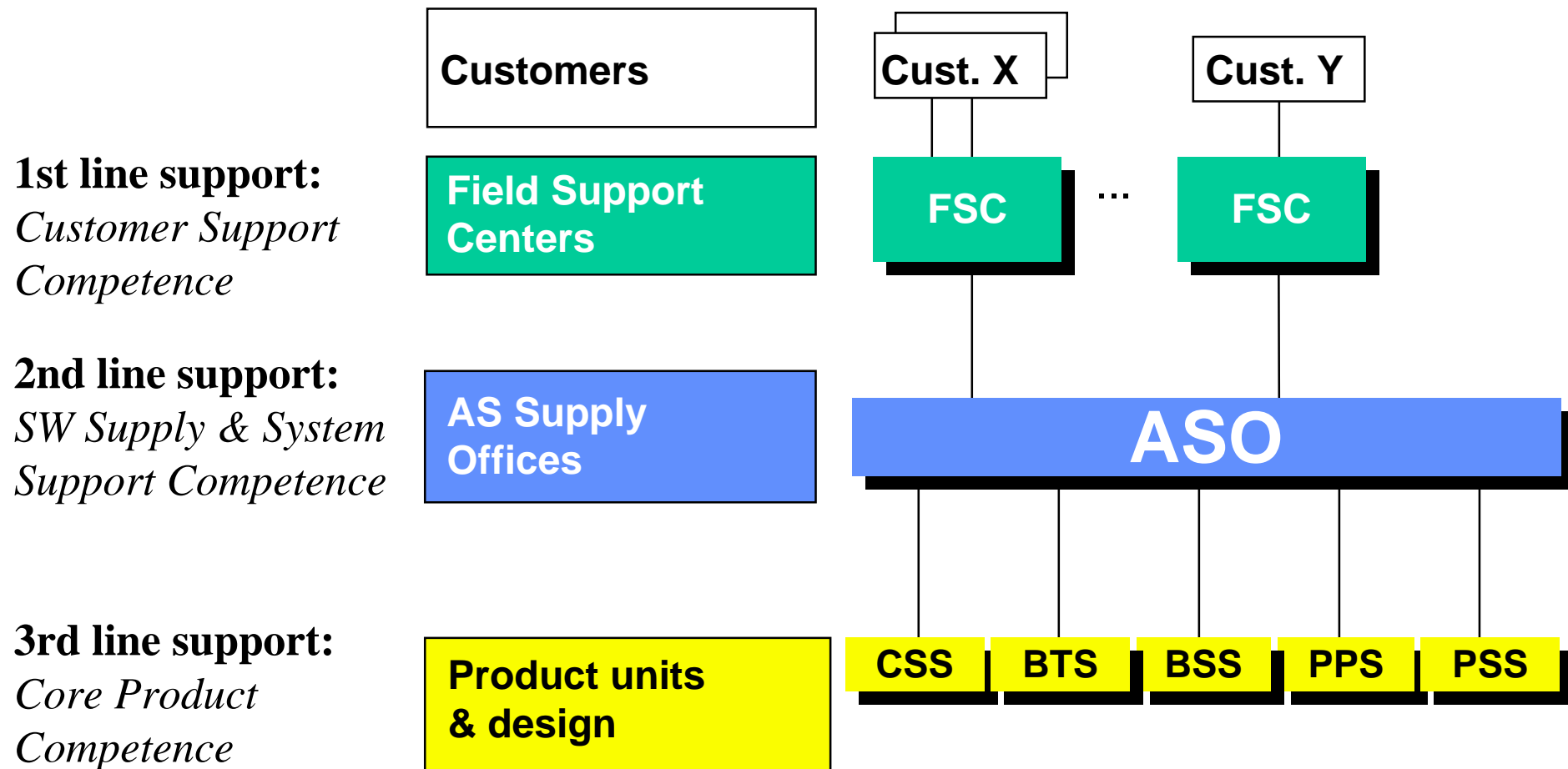
- ✗ **Trouble report handling**

- reporting procedures for trouble reports following agreed answering times
- statistics of TRs

- ✗ **Spare part service**

- in case of HW fault the operator can get a replacing spare part without the need for own stock of spare parts

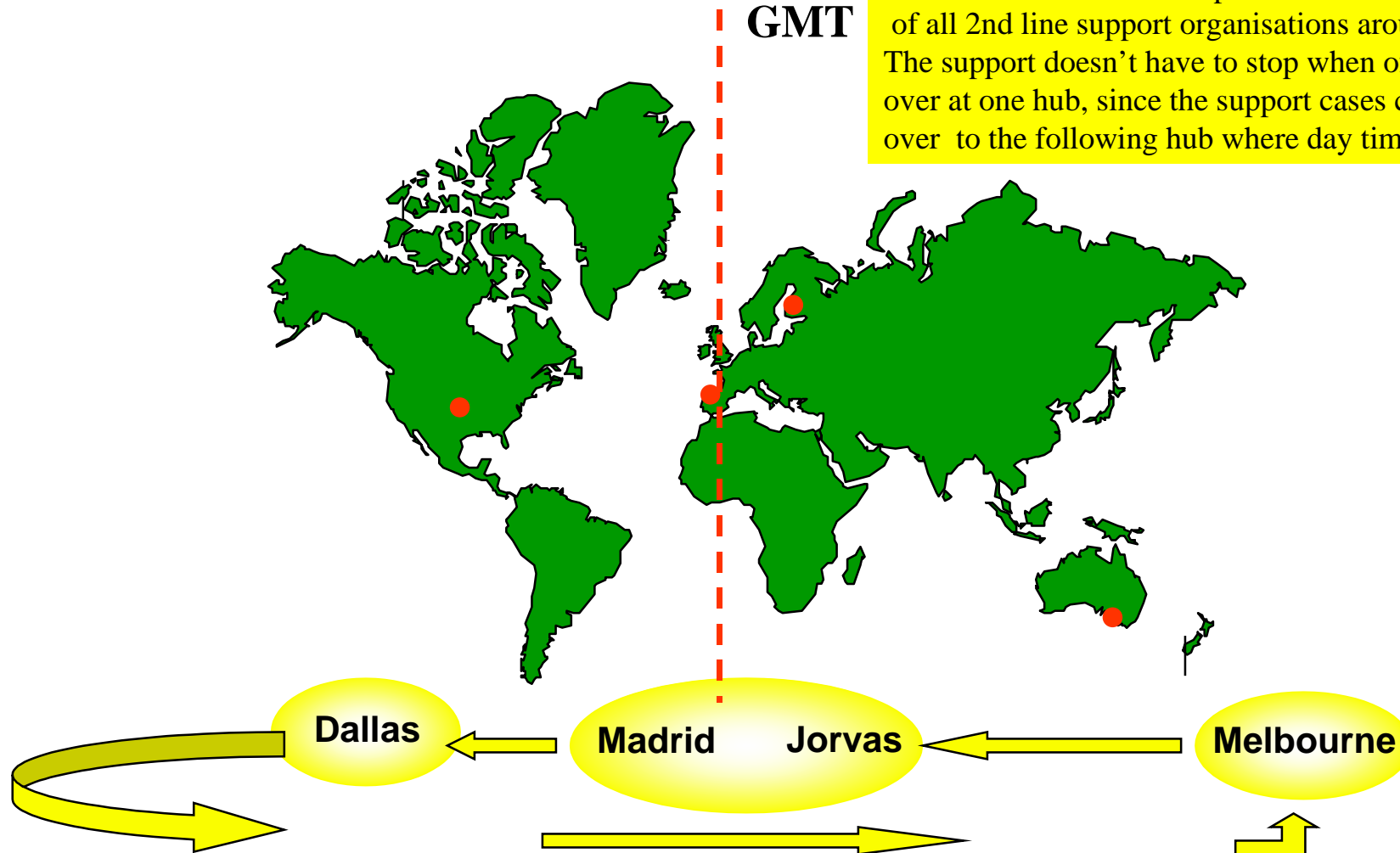
The maintenance and support chain for GSM SW



The support follows the sun ...

GMT

The *Follow the sun*-concept enables the utilization of all 2nd line support organisations around the world. The support doesn't have to stop when office hours are over at one hub, since the support cases can be handed over to the following hub where day time is starting!



The Millennium issue - the Problem



✗ The basic problem is...

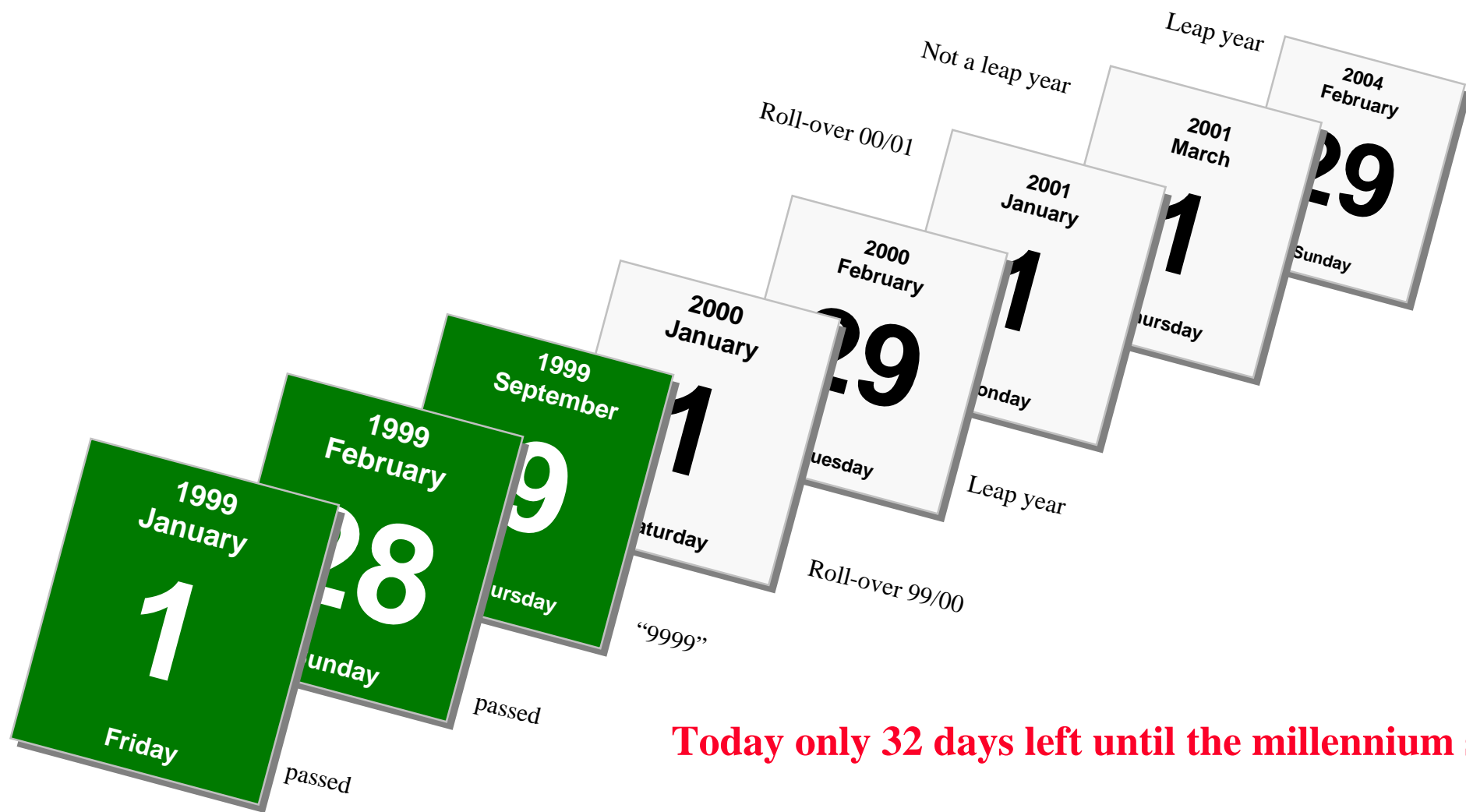
Year with 2 digits

00

instead of 4

2000

Millennium Issue – Critical Dates



Today only 32 days left until the millennium shift...

The Millennium issue - the Support

The Millennium Program is one of our highest priorities within Ericsson.

- The Ericsson millennium program was established at corporate level already in 1997
- Extensive program has been conducted throughout the organization and monitor the progress from top executive level
- Ericsson reported no disturbances in our systems or products related to the date shift to 9 September 1999 (9-9-99)



Abbreviations

AS	Application System
ASO	Application system Supply Office
FOA	First Office Application
FSC	Field Support Center
FSO	Field Support Office
GA	General Availability
GAS	Global Application System
MAS	Market Application System
PU	Product Unit