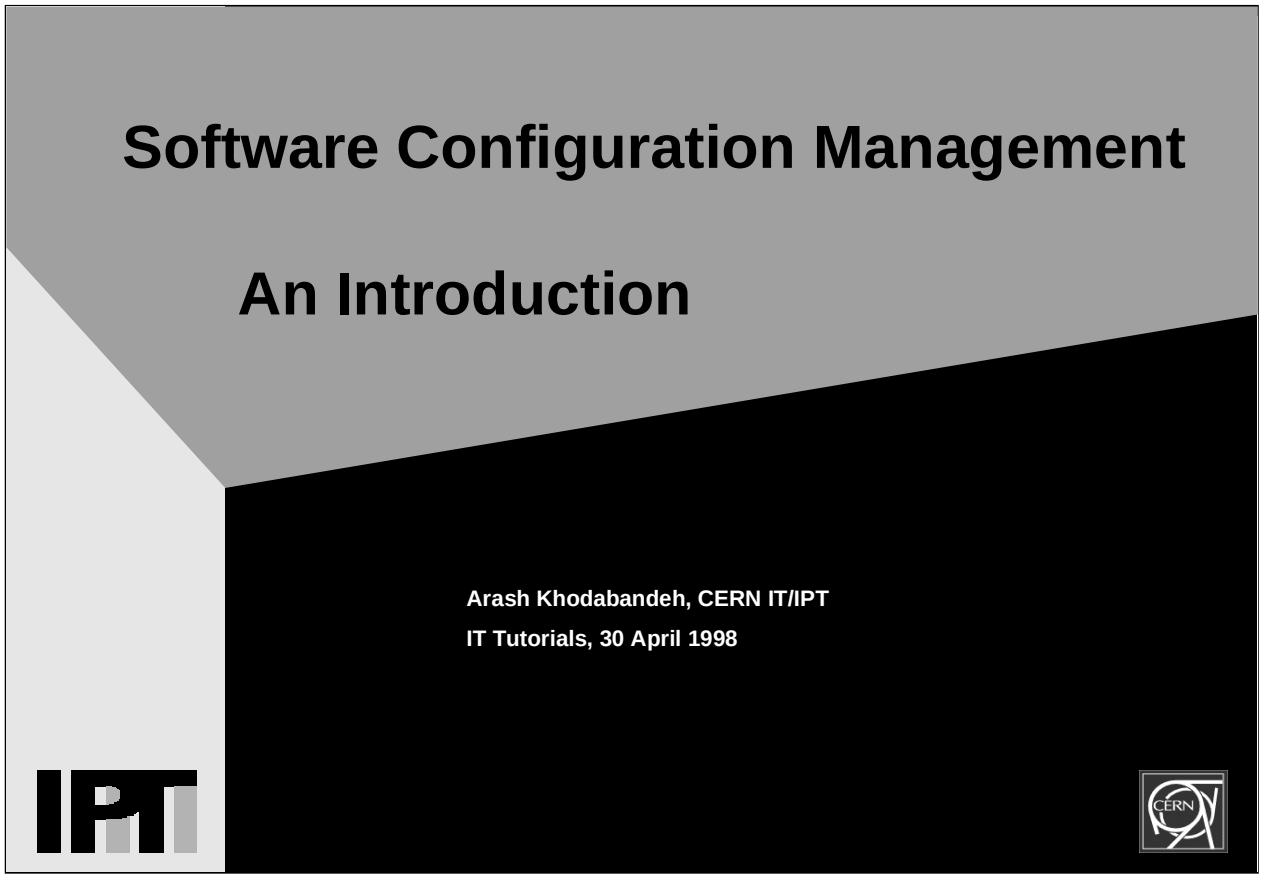

Software Configuration Management
An Introduction
Arash Khodabandeh, CERN IT/IPT
IT Tutorials, 30 April 1998
IPT
CERN

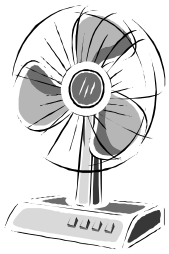
Talk Outline

- **Brainstorming**
- **What is Configuration Management?**
- **What can I do?**

Role Game

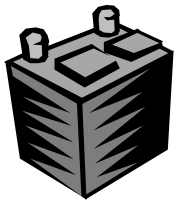
Lamp owner

Fan Owner



Power Supply Assembly

Battery Maker



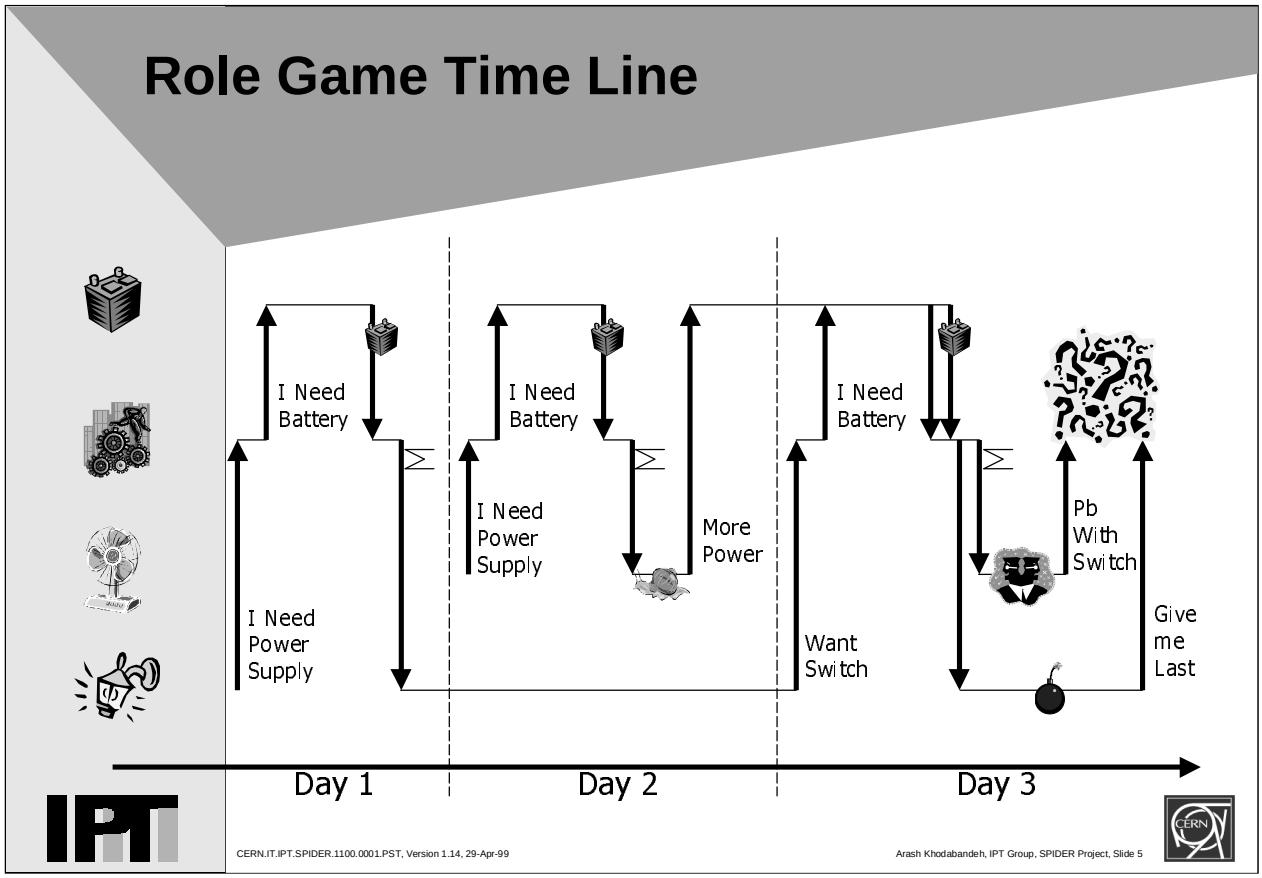
IPT

CERN.IT.IPT.SPIDER.1100.0001.PST, Version 1.14, 29-Apr-99

Arash Khodabandeh, IPT Group, SPIDER Project, Slide 3

Brainstorming

- What are the problems?
- What are the causes of the problems?
- What should be done to avoid them?


Role Game Time Line
I Need Battery
I Need Power Supply
I Need Battery
I Need Power Supply
More Power
I Need Battery
Want Switch
Pb With Switch
Give me Last
Day 1
Day 2
Day 3
IPT
CERN.IT.IPT.SPIDER.1100.0001.PST, Version 1.14, 29-Apr-99
Arash Khodabandeh, IPT Group, SPIDER Project, Slide 5

What Is Needed?

Change Control

Access Control and Security

Any Type of Item

Problem Tracking for any Item

Unique Identification

Release Note Generation

Support for Rules

Release Management

Comparison and Merge

Metrics Collection

Problem Relation

Roles and Responsibilities

History

Logging

Coherence

Version Control

Manage Relationships

Distribution/Deployment Management

Report Generation

Build Management

Defect Life Cycle

Why Configuration Management?

- We know what we have to produce
- We know where it is and which state it is in
- Only the right people can use or change it
- We understand the impact of the changes
- Needed information is available
- Agreed procedures are followed

4 Configuration Management Functions

- **Configuration Identification**
- **Configuration Control**
- **Status Accounting**
- **Configuration Auditing**

Configuration Item

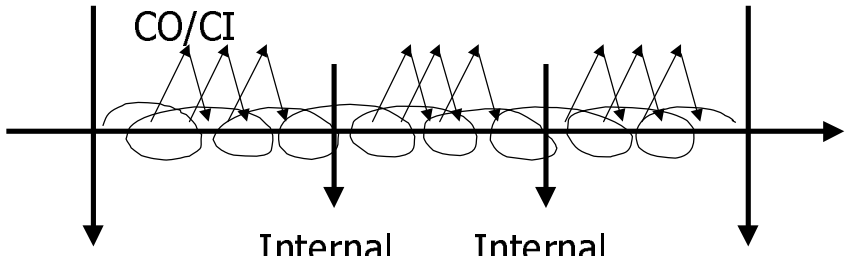
- **Anything that needs to be controlled**
- **Hierarchy**
- **too many vs. too few**
  class vs. instance

What Do We Have?
1 - Configuration Identification

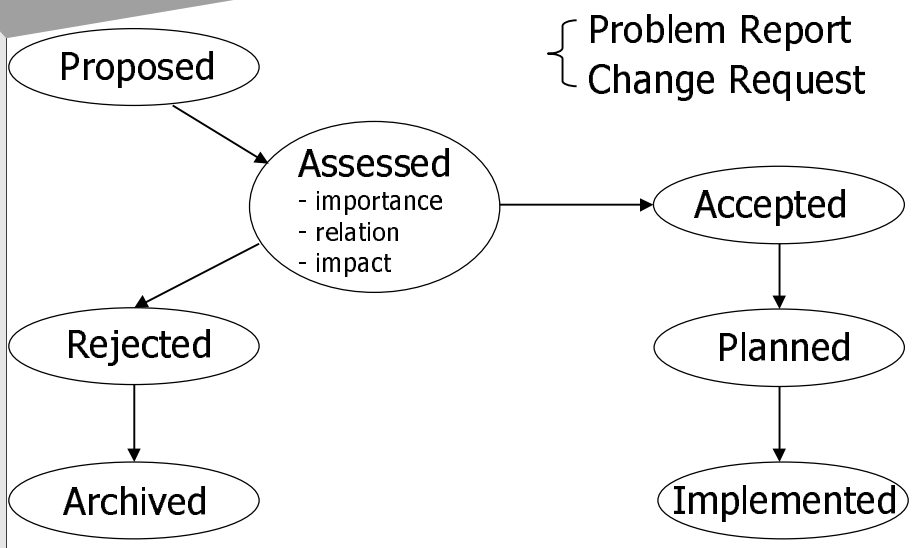
- **Type of configuration items**
- **Organize the structure**
- **Naming convention**
- **Version numbering scheme**
- **Baseline planning**

How to Control It?
2 - Configuration Control 1/2

- **Setup library**
- **All versions of all CIs**
- **Guaranty integrity**



How to Control It?
2 - Configuration Control 2/2



Configuration Control vs. Quick Fixes

- Only occurrence?
- Best fix?
- Side effects?
- Already identified?
- Supposed to be fixed!
- IS NOT LOST.

Did Everything Go Well? 3 - Configuration Auditing

- **Functional Audit**
- **Physical Audit**
- **Generate problem report**

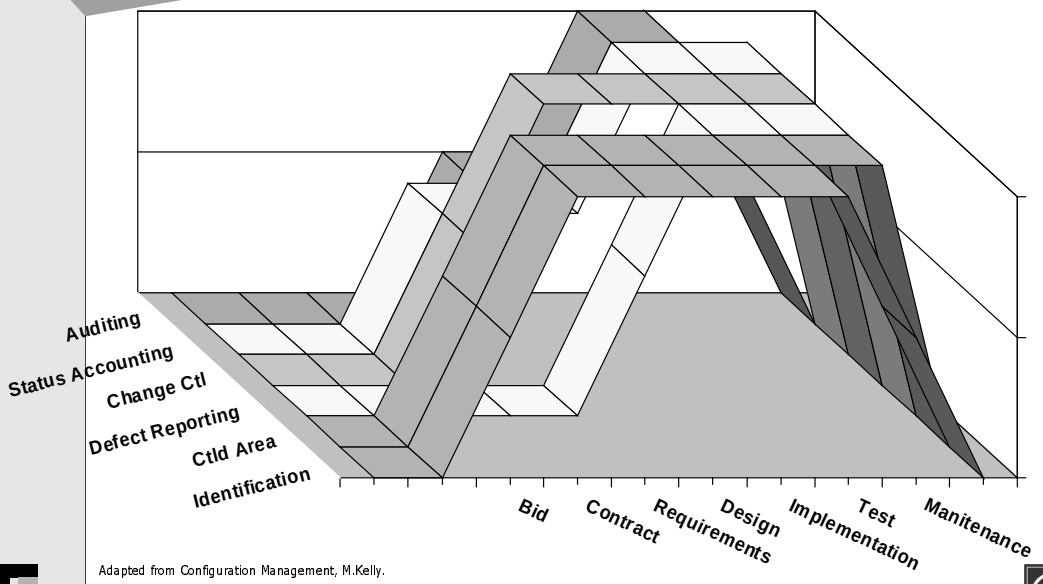
What Is Happening?
4 - Status Accounting

- **Collect data**
- **Provide visibility**
- **Generate improvements**
- **Notification**
- **Right data & right format**

Where Do I Start?

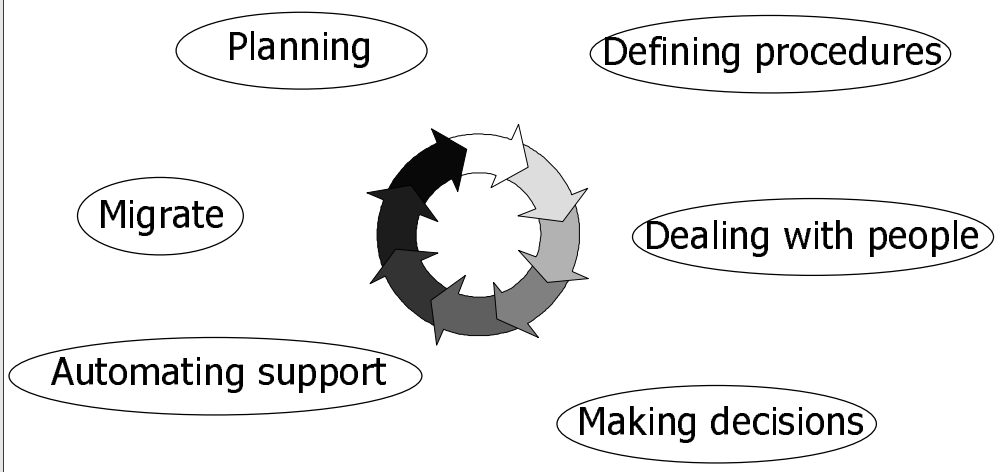
1. **Why start configuration management?**
2. **Who will be in charge?**
3. **What do we really need?**
4. **When do we need it?**
5. **How to do it?**

Example of CM Activities Evolution Per Project Phase

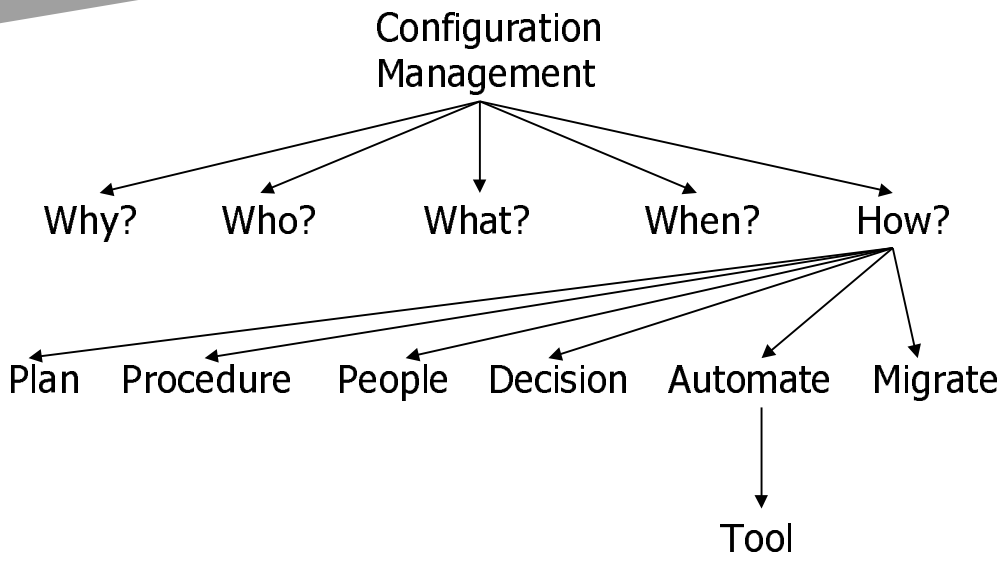


Adapted from Configuration Management, M.Kelly.

CM Implementation



Why Tools (Alone) Can Not Help?



What Is Done in HEP?

- CVS
- SRTs (BaBar, D0, CDF, ATLAS)
- CMT (LAL, Virgo, LHCb, NEMO, AUGER)
- SCRAM (CMS)
- SCaM project (SL, ST, LHC, PS)

More information can be found on the respective project / tools at the URLs below:

- **ATLAS SRT:**

  http://www.cern.ch/Atlas/GROUPS/SOFTWARE/DOCUMENTS/srt_html/book1.html
- **BaBar SRT:**

  http://www.slac.stanford.edu/BFROOT/www/Computing/Environment/Tools/SRT/SRTuser.html
- **FERMILAB SRT:**

  http://ods.fnal.gov/~amundson/
- **CMT:**

  http://www.lal.in2p3.fr/SI/CMT/CMT.htm
- **SCRAM:**

  http://cmsdoc.cern.ch/Releases/SCRAM/current/doc/html/index.html
- **SCaM:**

  http://venice.cern.ch/~slaps/hot/SCAM_II/

To Go Further

- **URLs**
  - **http://spider.cern.ch/Processes/ConfigurationManagement**
- **Books**
  - **Configuration Management, The Changing Image, Kelly, ISBN 0-07-707977-9, McGraw-Hill**
  - **Practical Software Configuration Management, Mikkelsen, ISBN 0-13-240854-6, Prentice-Hall**
- **Email**
  - **spider@cern.ch**