MANAGEMENT VERSUS SIGNALLING

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MANAGEMENT VERSUS SIGNALLING

INTRODUCTION
• TRADITIONAL VIEW
  • THESIS

GENERAL DESIGN THEORY
• TOP-DOWN
  • CYCLIC

A CYCLIC DESIGN PROCESS

REDESIGN

META-MANAGEMENT

AN INTEGRATED ARCHITECTURE
INTRODUCTION

Plane management function

GC = Global Control plane
LC = Local Control plane
U = User plane
INTRODUCTION

**THESIS:**

THERE IS NO PRINCIPLE DIFFERENCE BETWEEN SIGNALLING FUNCTIONS AND MANAGEMENT FUNCTIONS
INTRODUCTION

**IMPLICATION 1:**
IT SHOULD BE POSSIBLE TO USE THE SAME DESIGN PARADIGM FOR BOTH KIND OF FUNCTIONS

**IMPLICATION 2:**
IT SHOULD BE POSSIBLE TO MODEL BOTH KIND OF FUNCTIONS AS PART OF A SINGLE ARCHITECTURE
GENERAL DESIGN THEORY: TOP-DOWN

- USER REQUIREMENTS
- SERVICE
- PROTOCOL
- REALIZATION
GENERAL DESIGN THEORY: CYCLIC

USER REQUIREMENTS

subset 1

INITIAL SERVICE

INITIAL PROTOCOL

FIRST PROTOTYPE

subset 1 + 2

REVISED SERVICE

REVISED PROTOCOL

REVISED PROTOTYPE

all

FINAL SERVICE

FINAL PROTOCOL

COMPLETE REALIZATION
A CYCLIC DESIGN PROCESS

User Requirements

prototype
A CYCLIC DESIGN PROCESS

User Requirements

first realization

first realization

design

operational phase

time

9
A CYCLIC DESIGN PROCESS

SYSTEM 1

SIGNALLING PROTOCOL

SYSTEM 2
A CYCLIC DESIGN PROCESS

Manager

Managing System

Management Protocol

MIB
normal functions

Managed Systems
A CYCLIC DESIGN PROCESS

MANAGEMENT
CENTRALIZED
EXPLICIT
2 BASIC PDUs
VARIABLES
LOW LEVEL

SIGNALLING
DISTRIBUTED
IMPLICIT
MANY PDUs
COMMANDS
HIGH LEVEL
REDESIGN

User Requirements

first realization

better manager

design

redesign

operational phase

time
REDESIGN

CENTRALIZED → DISTRIBUTED
EXPLICIT → IMPLICIT
2 BASIC PDUs → MANY PDUs
VARIABLES → COMMANDS
LOW LEVEL → HIGH LEVEL

MANAGEMENT → SIGNALLING
REDESIGN: EXAMPLE

All User Requirements

- Basic network layer protocol
- ES-IS routing
- IS-IS intra-domain routing
- IS-IS inter-domain routing
- ES address assignment
- Group address extensions
META-MANAGEMENT

USER REQUIREMENTS

NORMAL FUNCTIONS

ELABORATION OF MANAGEMENT FUNCTIONS

ELABORATION OF META-MANAGEMENT FUNCTIONS
META-MANAGEMENT

SNMPv2 MIB
Party MIB
Manager to Manager MIB

Meta-management functions: SNMPv2

Management functions: SNMPv2

MIB-II

Primary functions: TCP
AN INTEGRATED ARCHITECTURE

layer N

P — data interactions — P
AN INTEGRATED ARCHITECTURE

layer N

P M ← data + management interactions → P M
AN INTEGRATED ARCHITECTURE

layer N

P M’

P M’

M’’
AN INTEGRATED ARCHITECTURE

management interactions

data interactions
AN INTEGRATED ARCHITECTURE

layer N

P M' P M' M''

underlying service provider
AN INTEGRATED ARCHITECTURE

Layer N

Service provider for normal user data

PM' M''

Service provider for management information

P M'
MULTIPLE MANAGEMENT ARCHITECTURES

• SERVICE MANAGEMENT
• PROTOCOL MANAGEMENT
• ELEMENT MANAGEMENT

SIMILAR IDEAS AS TMN
BETTER FORMALIZED
SERVICE MANAGEMENT ARCHITECTURE

normal (data) SAPs

service provider

addition of service management

special (service management) SAP to connect service manager

normal (data) SAPs
SERVICE MANAGEMENT ARCHITECTURE

Telecom view of service provider

Normal user Normal user Normal user Normal user

functional view of service provider
TIOS and the UT

UT

INF  EL

IS  SETI  SPA  TIOS  BIO  BSC  ICE  ICS  TDM
ORGANIZATION TIOS

ARCHITECTURE (VISSERS)
FORMAL METHODS (BRINKSMA)
TOOLS (ALBLAS)
QUANTITATIVE METHODS (NICOLA)
APPLICATION PROTOCOLS (MICHIELS)
COMMUNICATION PROTOCOLS (NIEMEGEERS)
TRANSMISSION (VAN ETTEN)
OPERATIONAL ASPECTS & MANAGEMENT (BAKKER)
MEMBERS:

- KEES BAKKER (PART-TIME PROFESSOR)
- AIKO PRAS (RESEARCHER)
- ERIC VAN HENGSTUM (SOFTWARE ENGINEER)
- HARRIE HAZEWINKEL (PROJECT RESEARCHER)
- MANY STUDENTS

PROJECTS:

- UT-SNMPv2 / DAMOCLES (internal)
- ATM MANAGEMENT (SURFNET-4)
  - WWW MANAGEMENT (EC)
- HIERARCHICAL MANAGEMENET (EC?)