

Developing a common control standard

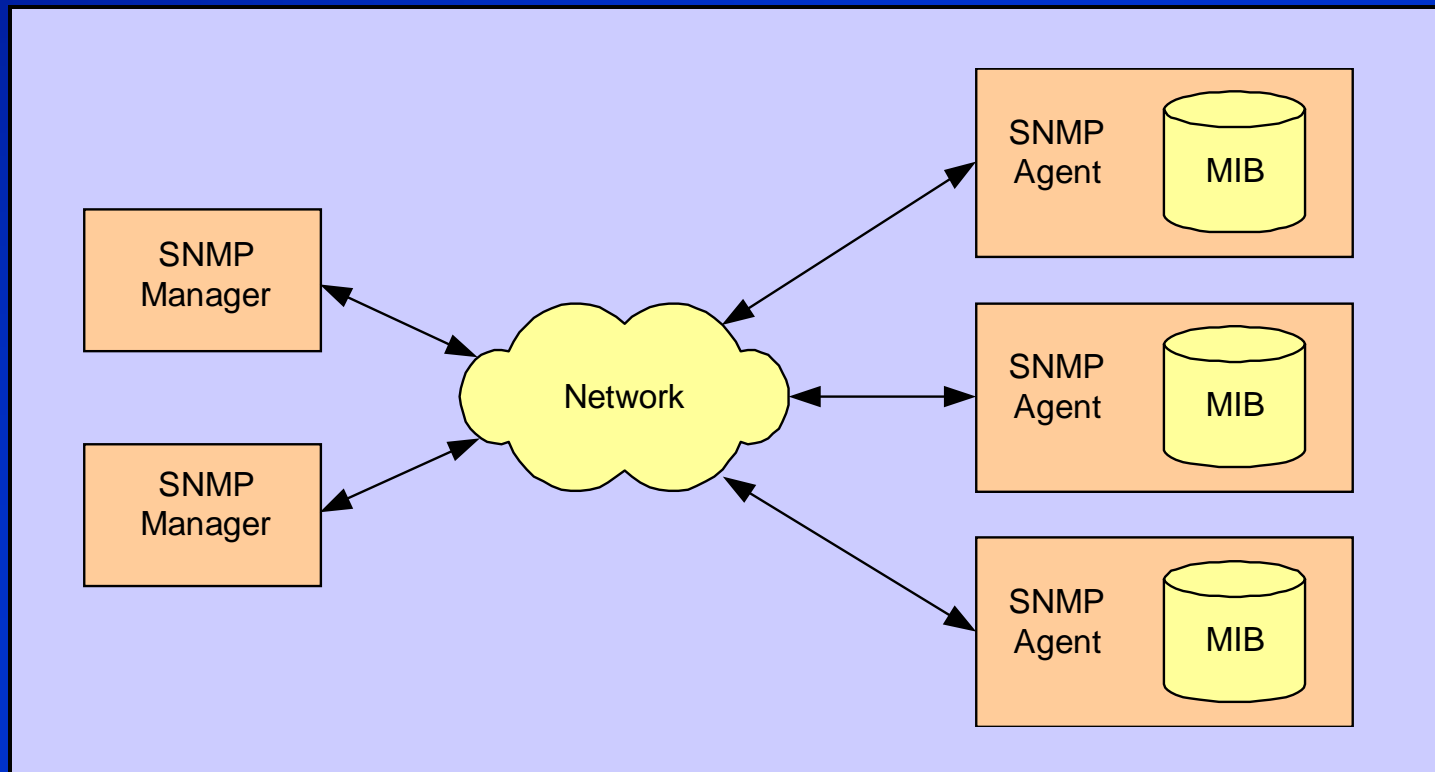
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Introduction

- Computer based network technologies are becoming ever more prevalent in the broadcasting industry
- An open standard for the management of network connected equipment will become essential
- The common control protocol provides a solution!

Simple Network Management Protocol

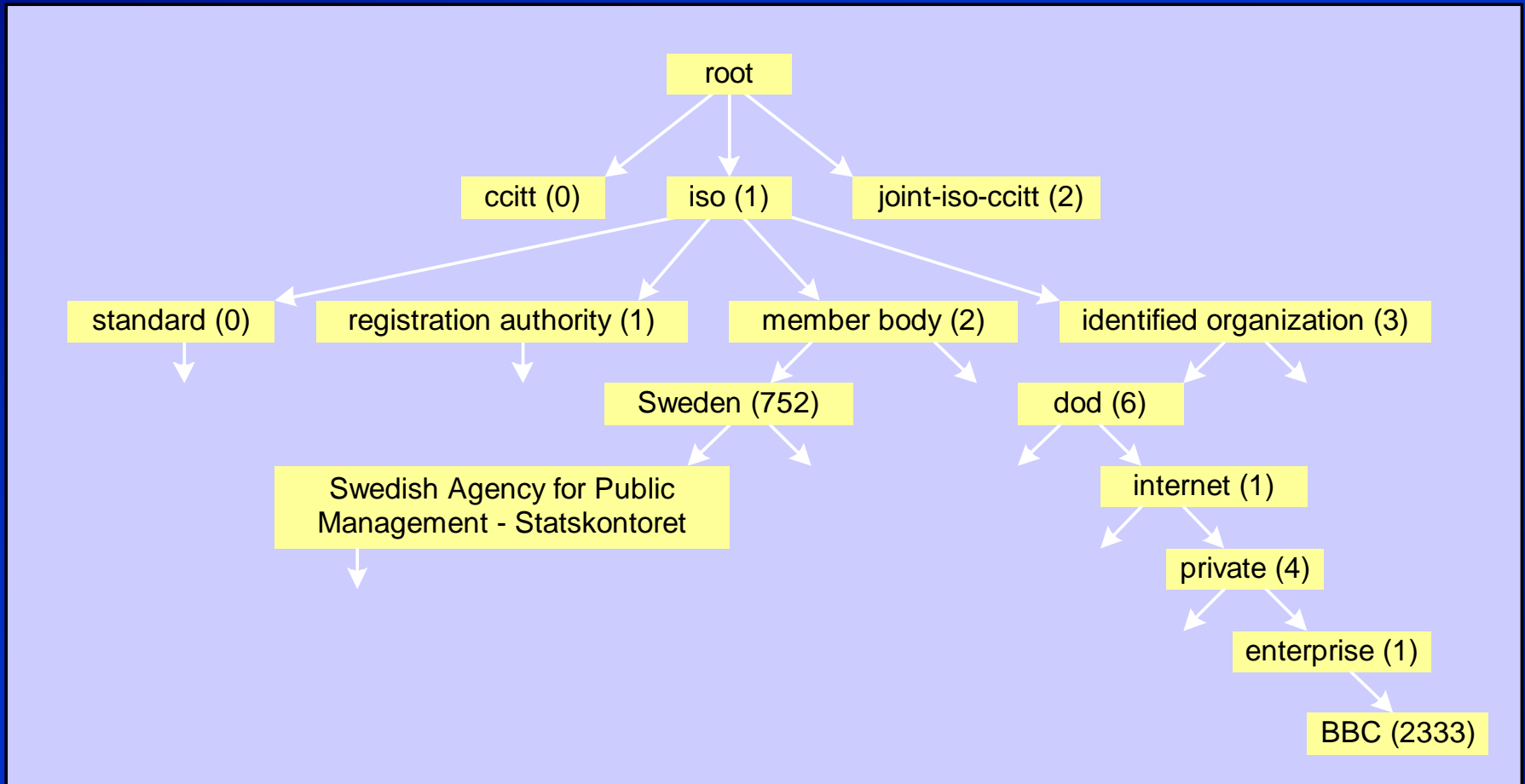
- Devices on the network are controlled using SNMP



Management Information Base

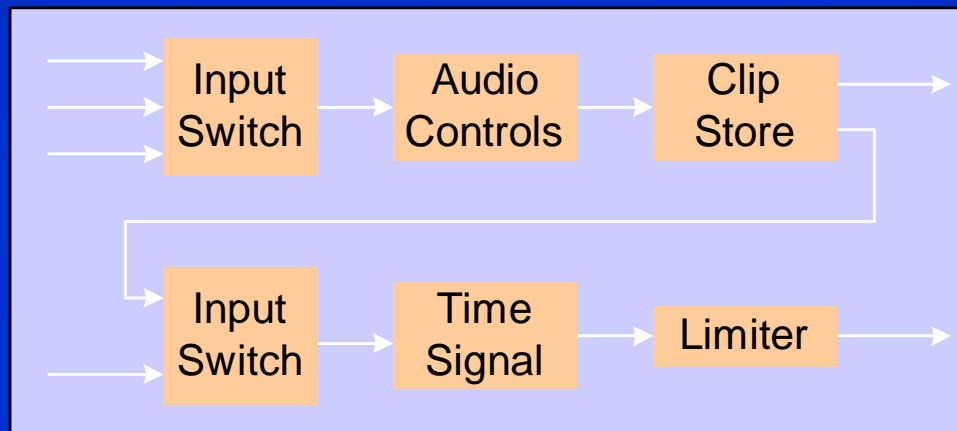
- A collection of objects defining the functionality of equipment
- Equipment is controlled by issuing a *set* request to change an object's value
- Current configuration is obtained by issuing a *get* request

Object identifiers

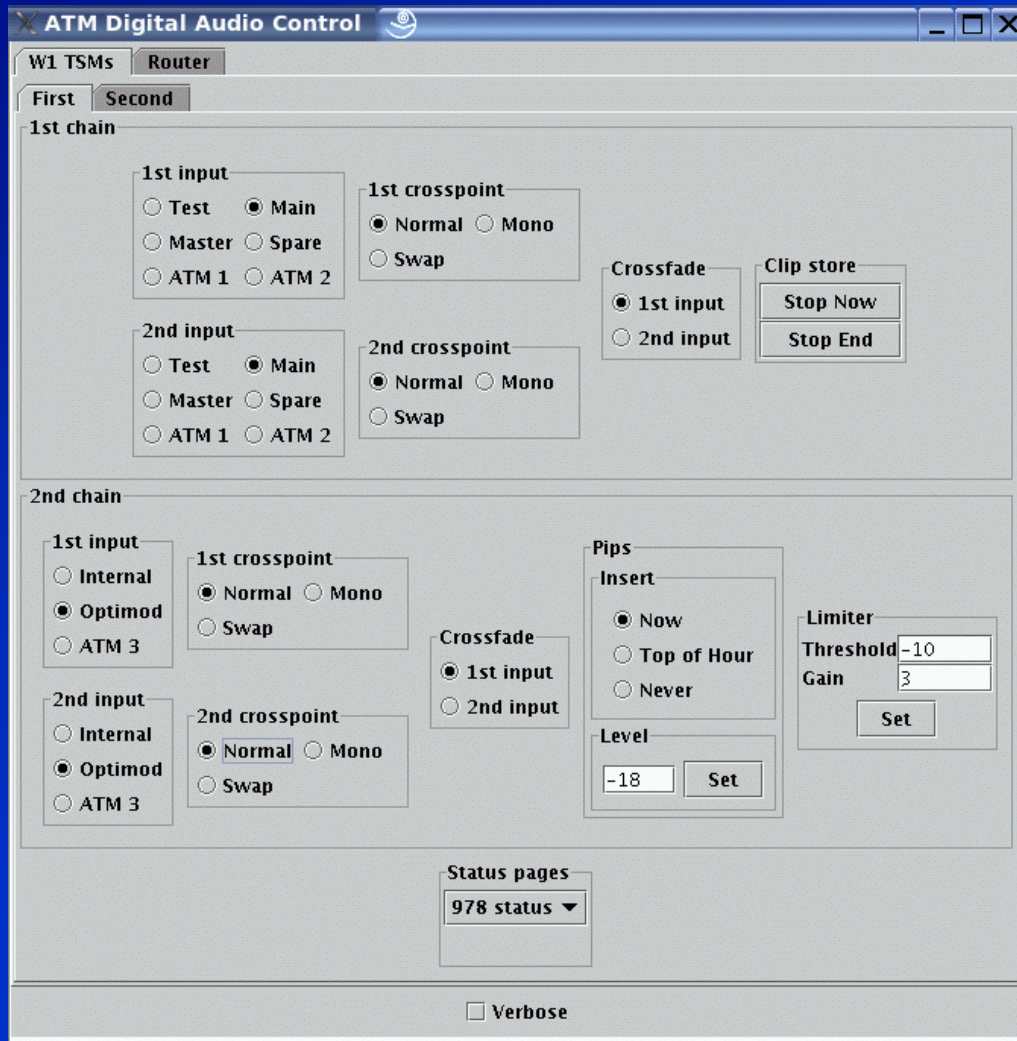


Transmission Stream Manager

- Designed for the redevelopment of BBC Broadcasting House in London
- Uses initial version of the audio MIB
- Simplified block diagram:

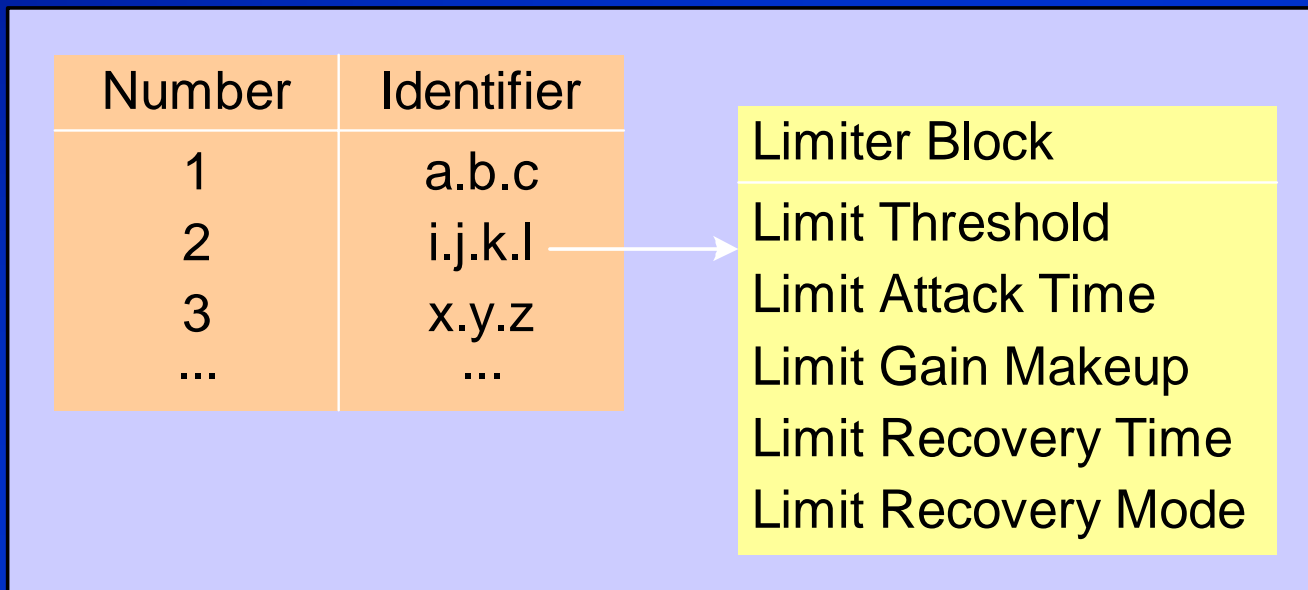


A more user friendly interface...

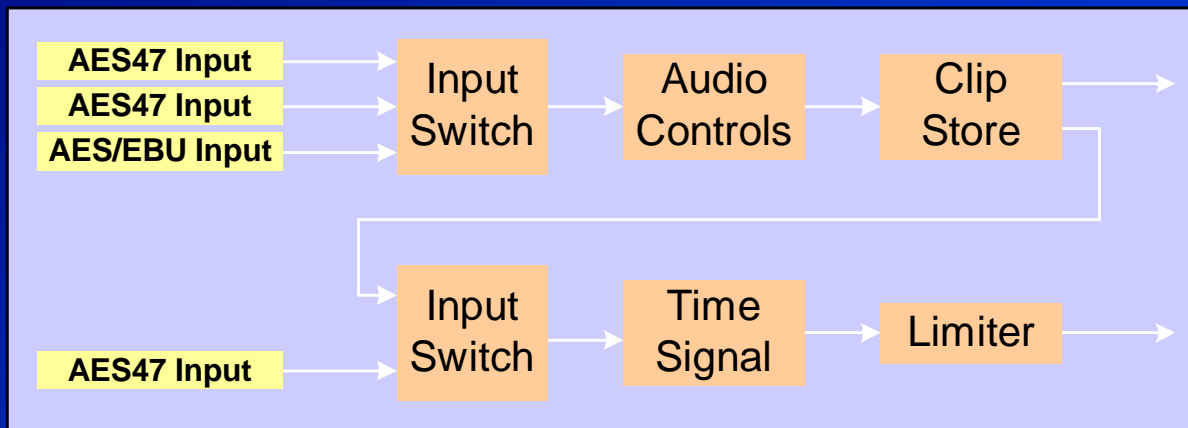


Block structure

- Blocks map the control structure to a product's functionality



Example of the block structure



Number	Identifier
1	AES47 input
2	AES47 input
3	AES/EBU input
4	Input Switch
5	Audio Controls
6	Clip Store
...	...

Input Switch		Clip Store	
Input	Block	Input	Block
1	1	1	5
2	2		
3	3		

Privilege levels

- Management calls may be distinguished according to a privilege level:
 - Listener
 - Operator
 - Supervisor
 - Maintenance

Status broadcasts

Status Page Receiver - 47.000580FFE10003001C03001C.303230303633.00			
Current state: connected!		Received pages: 364	Selector byte: 0
Page Type 1	Power & Ref Status 7	Reference Rate 0	Unit uptime 1086283
Spare --	A - Dest Port 1 - Input 2	A - Dest Port 2 - Input 3	B - Dest Port 1 - Invert LL 0; RL 0; LR 0; RR 0
B - Dest Port 1 - LL Gain 0 dB	B - Dest Port 1 - RL Gain -200 dB	B - Dest Port 1 - LR Gain -200 dB	B - Dest Port 1 - RR Gain 0 dB
B - Dest Port 2 - Invert LL 0; RL 0; LR 0; RR 0	B - Dest Port 2 - LL Gain 0 dB	B - Dest Port 2 - RL Gain -200 dB	B - Dest Port 2 - LR Gain -200 dB
B - Dest Port 2 - RR Gain 0 dB	B - Dest Port 3 - Input 1 Rate 0	B - Dest Port 3 - Input 2 Rate 0	B - Dest Port 3 - Output Rate 48000
B - Dest Port 3 - Input 1 Sync 0	B - Dest Port 3 - Input 2 Sync 0	C - Dest Port 3 - Input 2	D - ALD Status Failure
D - ALD Warning Count 953	D - ALD Failure Count 953	E - Clip Input Playback Status Playing	E - Clip Input Playlist Status Playlist ok
E - Clip Input Current File 1330529585	E - Clip Input Time Left -773	E - Now Processing Fader Level 0 dB	E - Clip Input Fader Level -200 dB
F - Dest Port 4 - Input 2	F - Dest Port 4 - Int Input False	F - Dest Port 5 - Input 2	F - Dest Port 5 - Int Input False
G - Dest Port 4 - Invert LL 0; RL 0; LR 0; RR 0	G - Dest Port 4 - LL Gain 0 dB	G - Dest Port 4 - RL Gain -200 dB	G - Dest Port 4 - LR Gain -200 dB
G - Dest Port 4 - RR Gain 0 dB	G - Dest Port 5 - Invert LL 0; RL 0; LR 0; RR 0	G - Dest Port 5 - LL Gain 0 dB	G - Dest Port 5 - RL Gain -200 dB
G - Dest Port 5 - LR Gain -200 dB	G - Dest Port 5 - RR Gain 0 dB	G - Dest Port 6 - Input 1 Sync 0	G - Dest Port 6 - Input 2 Sync 0
H - Dest Port 6 - Input 2	J - PIPs Status 2	J - Next PIPs 0 0 0 0 0 0	K - Limiter Threshold -10 dB
L - Headroom 3 dB	M - SRC Status False	M - SRC From 0	M - SRC To 0
N - Delay 0			

Conclusions

- **Important** – broadcasting is moving to network based structures and the ability to control this is vital!
- **Single protocol** - SNMP is used as the management protocol which defines functionality according to a MIB
- **Flexible** – standard defined processing blocks and manufacturer specific blocks allow for flexibility
- **Network agnostic** - uses any network (Ethernet, ATM, etc)
- **Standardised** – by the IEC with EBU input from the N/CNCS working group