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Distributed Control of ATM Networks

Management Report Q4: 1/12/95 - 29/2/96

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Abstract

This docment is the fourth quarterly management report for the DCAN project.

It covers the period from 1-12-1995 to 29-2-1996.

APM.1733.01 **Approved** 29th March 1996

Project Management (confidential to DCAN consortium for 2 years)

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1 Overview

1.1 Summary

Overall progress in the project is on target.

APM overspent its effort budget in Year 1 by just over 3 personmonths. CUCL has run up its underspend of just over 8 personmonths in the first three quarters of the project but has overcome its effort shortage now. Nemesys has underspent by just over 1 personmonth. This has had a small impact on the delivery of results from WP 3 in particular. We expect this to be rectified in the next quarter.

Technical progress is good. This quarter saw the planned delivery of two related workpackages:

- Device protocol: defined in document number APM.1706.01
- Demonstration of device control and audio/video switching: the demonstration was mounted by Nemesys during the fourth quarterly progress and management meeting.

The demonstration also confirmed the deliverable for workpackage 4.2, which was delivered in Q2.

It was agreed that the order of delivery of results be altered to better suit the investigative nature of the work. Prototyping is carried out as part of the requirements and design phase and it has therefore been agreed to deliver workpackages 3.2 and 3.3 together on the delivery date for WP. 3.3.

To allow inputs from outside the project (in particular the ATM OpenSig, organised by Columbia University, New York in April 1996) WP 4.3 will be delayed until May.

The project continues to disseminate its results:

- amongst other HPIP projects: we attended the HPIP meeting in February 1996;
- amongst telecommunications companies: we presented the project to the ANSA Management and Technical Committees and received strong interest from Bellcore, GPT, France Telecom and Nortel;
- amongst our respective customers;
- in the research community: we are feeding project results into the ATM OpenSig.

2 Report by activity

The following is a report of progress of the activities which are in progress according to the DCAN Level 2 plan (APM.1457.01.02).

Progress is summarised in the table below.

Table 2.1: Summary of progress by activity

Task	status	compared with Level 2 plan
2.1	completed Q3	
2.2	completed Q2	
2.3	in progress	ahead of schedule
2.4	in progress	on schedule
2.5	not started	-
2.6	not started	-
3.1	in progress	behind schedule*
3.2	in progress	on schedule
3.3	not started	-
3.4	not started	-
3.5	not started	-
4.1	completed Q1	
4.2	completed Q2	
4.3	in progress	behind schedule*
4.4	in progress	on schedule
4.5	not started	-
4.6	not started	-
5.1	completed Q2	
5.2	completed Q4	
5.3	completed Q4	
5.4	in progress	on schedule
5.5	not started	-
5.6	not started	-
5.7	not started	-

* now running in parallel with tasks 3.2 and 4.4

2.1 Workpackage 1: Project Management

Workpackage leader: APM

2.1.1 Project plan

No updates to the plan have been made. Some workpackages are proving not to be serialisable as originally planned. However, the project manages to

complete design and implementation or demonstration tasks within the overall timeframe. The current version of the plan is APM.1457.01.02.

2.1.2 Dissemination and user group

The DCAN project attended the HPIP meeting at the DTI on Feb. 7th 1996. This was a useful day in which several contacts with colleagues were established.

ANSA's sponsorship and Nemesys' customers are deemed to form the initial "user group" for the DCAN project.

Several DCAN documents are available to ANSA sponsors and a presentation to the ANSA Management and Technical Committee was well received. These committees consist of representatives from BT, Bellcore (USA), Defence Research Agency (DRA), Eurocontrol (Belgium), France Telecom, Fujitsu Laboratories (Japan), GEC, GPT, HP, ICL, NORTEL and Telefonica (Spain).

The DCAN web page at: http://www.ansa.co.uk/DCAN/index.html continues to be visited frequently.

Several team members are planning to attend the ATM OpenSig, organised by Columbia University, New York in April 1996.

2.2 Workpackage 2: ANSA for time constrained systems

Workpackage leader: CUCL

2.2.1 Activity 2.3: nucleus redesign

This activity is on schedule for delivery in August 1996.

A pilot implementation of ANSA DIMMA Nucleus was provided to CUCL in December 1995. This code is now being used for experiments with the control architecture (WP. 4.3 and 4.4). The resulting experience is being brought back to APM.

APM are building a CORBA API over the DIMMA nucleus. This should make it possible for application written for CORBA to be ported to the DIMMA Nucleus. Not all data types are supported. APM will provide a suitable CORBA-IDL subset, which can be extended with stream data types, while the CORBA API is extended with real time functions.

There will be no interoperability between ANSAware and DIMMA. DIMMA does however provide IIOP by which it can interoperate with commercial CORBA products, only limited by the lack of support for the data type ANY.

APM and CUCL are making sure that future releases of the underlying real time operating system (Pegasus II) can be accommodated.

In summary, the work is on schedule, with prototyping in an advanced stage. It was agreed that 8/96 would be the date at which the design would be published.

2.3 Workpackage 3: ATM API

Workpackage leader: CUCL

2.3.1 Activity 3.1 and 3.2: ATM MultiMedia API

Activity 3.1 is behind schedule, while activity 3.2 is on schedule; both activities taken together or on schedule for delivery in May 1996.

The design and implementation are not serialisable and for this reason, it was agreed in the third quarterly progress meeting that both should proceed simultaneously, delivering results in May 1996.

Work in this area is underway, with the initial design of the DCAN API emerging alongside coded versions used to test the strength of design assumptions made.

An important design aim is to be able to layer the DCAN API over the API's which are being shipped by the major vendors.

The deliverable is expected to be structured as follows:

1. DCAN ATM API Architecture
2. The API itself (including interfaces)
3. Annexes: one for the mapping to each vendor's API.

The roll out plan for this deliverable is to announce the API and make it available publicly. To encourage take-up we plan to leverage visibility through the OpenSig, organised by Columbia University, New York, which will be attended by several team members.

2.4 Workpackage 4: Control of ATM switches

Workpackage leader: APM

2.4.1 Activity 4.2: Master end switch control protocol

This activity was completed this quarter and accepted at the 4th quarterly DCAN Management meeting, as part of the demonstration of audio video switching.

No document was planned or has been produced.

See the report for activity 5.3 for further details.

2.4.2 Activity4.3: distributed control system design

This activity is behind schedule; to deliver in May 1996.

The design for the distributed control system was due 2/96. Although several design documents exist, it was felt that the feed-back from prototyping is extremely important. The project agreed with the project monitor that the quality of the deliverable could be significantly enhanced if input from the OpenSig meeting in New York (late April 1996) could be taken into account. Another factor is the recent publication of GSMP: General Switch Management Protocol (published by Ypsilon). It was felt that this too should be taken into account.

We will then release a “public first draft”. This draft is expected to change as implementation experience emerges.

2.4.3 Activity 4.4: distributed control system design & UNIX implementation

This activity is on schedule for delivery November 1996.

APM have started emulation work using JAVA and CORBA IDL to emulate a network of switches. Trading, binding and connection management functions produced by CUCL are being investigated.

Different switch vendors support different switch interfaces. Some sport SMTP, CUCL's Fairisle has a more general interface. If GSMP is successful, then it will also need supporting.

2.5 Workpackage 5: Control of simple devices

Workpackage leader: Nemesys Research

2.5.1 Activity 5.2: Dumb device protocol

This activity was completed this quarter and accepted at the 4th quarterly DCAN Management meeting, as part of a demonstration.

Deliverable: APM.1706.01 describes the protocol.

See the report for activity 5.3 for further details.

2.5.2 Activity 5.3: Demonstration of audio video switching

This activity was completed this quarter and accepted at the 4th quarterly DCAN Management meeting, as part of a demonstration.

The demonstration covered delivery of work done under activities 4.2, 5.2 and 5.3.

A demonstration was mounted at the Fourth Quarterly Progress Management Meeting. The demonstration showed a video source (camera) connected via an AVA-200 (encoder) to an ATM network with several switches of different manufacture. The other end of the link comprised an ATV-300 decoder feeding its signal to a TV set. The ATA, ATV and ATM network are controlled remotely via a Sun workstation.

The demonstration showed:

- proxy signalling dumb devices (AVAs) with full signalling support running in user processes on UNIX workstations
- error recovery: disconnection of one of the fibres caused loss of the ATM connection. Reconnection caused the network management software to rebuild a connection, resuming the video feed which had become frozen in the meantime;
- feeds can be taken from remote sources, such as various cameras in the Computer Lab.

The demonstration was successful, and the deliverables for workpackages 4.2, 5.2 and 5.3 were accepted as complete.

3 Effort

The effort expended and the planned effort over the period were as follows:

Table 3.1: Effort in person-months

Partner	Effort this period	Effort up to last period	Effort to date	Effort planned	under/over spend
APM	6.04	34.57	40.61	37.50	-3.11
CUCL	6.00	10.00	16.00	24.25	8.25
Nemesys	2.30	9.00	11.30	12.50	1.20
total	14.34	53.57	67.91	74.25	6.34

APM has overspent its effort budget in Year 1 by just over 3 personmonths. This is mainly due to early work done on the design and pilot implementation of the real time nucleus. The overspend is not expected to have an impact on future deliverables.

CUCL has run up its underspend of just over 8 personmonths in the first three quarters of the project. Its spend in Q4 was nearly on target. The effort shortage indicated in earlier reports has been solved. There has been a small impact on the delivery of results from WP 3 in particular. We expect this to be rectified in the next two quarters.

Nemesys has underspent its manpower budget by 1.2 personmonths, mainly in the last two quarters. In the same period, the deliverables for which Nemesys was responsible have been delivered. We expect that Nemesys' spend will catch up in the next two quarters.