

© British Standards Institution. No part of this publication may be photocopied or otherwise reproduced without the prior permission in writing of BSI

Draft for Development

Open systems interconnection: job transfer and manipulation concepts and services (ISO DP 8831)

Publications referred to

See national foreword

Contents

	BS page		BS page
National foreword	2	15. JTM service primitives	121
Committees responsible	Back cover	15.1 Parameters of J-INITIATE request and confirm primitives	121
Draft for Development		15.2 J-DISPOSE indication and response primitives	122
0. Introduction	3	15.3 J-GIVE service primitives	124
1. Scope and field of application	4	15.4 J-ENQUIRE indication and response primitives	126
2. References	5	15.5 J-MESSAGE request primitive	127
3. Definitions	5	15.6 J-SPAWN request primitive	128
4. Abbreviations	6	15.7 J-TASKEND request primitive	128
5. Conventions	6	15.8 J-STATUS indication and response primitives	128
Section one. General		15.9 J-HOLD, J-RELEASE, J-KILL, J-STOP indications	129
6. Overview and general description	7	15.10 Summary	130
6.1 Overview	7	16. Conformance to the JTM service definition	133
6.2 Work specification contents	8	Section three. Basic Class	
6.3 Proformas and spawning	11	17. Restrictions for Basic Class	134
6.4 Source, sink and execution agencies	12	17.1 Service primitive groups	134
6.5 OSI jobs	14	17.2 Document classes	134
6.6 Processing of work specifications	15	17.3 J-INITIATE request parameters	135
6.7 Reporting and the monitor function	17	17.4 JTM action parameters	137
6.8 Commitment, concurrency and recovery	22	17.5 Proformas	139
6.9 Transfer control	25	17.6 Summary of information contained in Basic Class J-INITIATE	142
6.10 Report manipulation	26	17.7 Summary of Basic Class primitives and parameters	144
6.11 Work manipulation	27	17.8 Conformance	144
6.12 Transfer manipulation	30	Annexes	
6.13 Authorisation and accounting	32	A. JTM service conventions	146
6.14 Work specification identification	34	B. Registers of document classes	156
6.15 Reporting responsibility	36	C. Register entries for document classes	162
6.16 Documents	40	D. Tutorial annex	172
7. Overview of the service	42	E. Glossary of terms	207
8. Basic and full classes	43	National appendix	
9. Model for the service specification	44	A. Commitment, concurrency and recovery user data	213
Section two. Definition of primitives		Table	
10. Use of the service primitive concept	47	12-1 Event parameters	69
10.1 Service primitive groups	47	Figures	
10.2 Components of service primitive groups	50	9-1 <i>Untitled</i>	45
10.3 Sequence of service primitive groups	53	15-1 Primitives potentially used in the processing of a single subjob	130
10.4 Sequence of primitives at different access points	55	15-2 Summary of JTM Service Primitives and Parameters – (1)	131
11. Notation for service primitive and datastructure definition	56	15-3 Summary of JTM Service Primitives and Parameters – (2)	132
11.1 Basic datatypes	56	17-1 Summary of JTM Basic Class Service Model	145
11.2 Structuring mechanisms	57	1 An illustration of work specification processing	176
11.3 Definition of basic datatypes	58	D-2 JTM activity	192
12. JTM events and report parameters	61	D-3 An illustration of a simple use of JTM	196
12.1 Event categories and report generation	61	D-4 Primitive dependencies	201
12.2 Reports	66		
13. Fields of the conceptual data structures	70		
13.1 A work specification	72		
13.2 OSI job parameters	74		
13.3 OSI subjob parameters	81		
13.4 JTM action parameters	87		
13.5 Proformas	109		
13.6 The header list	111		
13.7 The transfer control record	117		
14. JTM documents	118		
14.1 Report display document	118		
14.2 Work display document	119		
14.3 TCR display document	120		



DD 105: 1985

This publication is not to be regarded as a British Standard.

It is being issued in the Draft for Development series of publications and is of a provisional nature because the subject matter is in the process of ongoing development within the International Standards Committee (ISO/TC 97/SC 21 Information Retrieval, Transfer and Management for Open Systems Interconnection).

It should be applied on this provisional basis, so that information and experience of its practical application may be obtained.

A review of this Draft for Development will be carried out not later than two years after its publication. Notification of the start of the review period, with a request for the submission of comments from users of this Draft for Development will be made in an announcement in the appropriate issue of *BSI News*. Observations which it is felt should receive attention before the official call for comments will be welcomed.

According to the replies, the responsible BSI Committee will judge whether the Draft for Development can be converted into a British Standard or what other action should be taken.

National foreword

This Draft for Development has been prepared under the direction of the Office and Information Standards Committee.

The primary objective of this Draft for Development is to give advance guidance to product and systems designers concerned with job transfer and manipulation in the Application Layer of the Basic Reference Model for Open Systems Interconnection (OSI).

The text of the Draft for Development is identical with the first Draft Proposal ISO/DP 8831 issued November 1984 (reference ISO/TC 97/SC 21 N 210) by the International Organization for Standardization (ISO).

For ease of reproduction the ISO text of the first Draft Proposal has been reproduced unchanged.

A second Draft Proposal ISO/DP 8831.2 was issued July 1985 (reference ISO/TC 97/SC 21 N 520) which contained changes to make the Draft Proposal compatible with ISO/DIS 8649/3 (published by BSI as DD 109). It is not intended to reproduce the text of the second Draft Proposal, but national appendix A contains additional material to enable the current text to be used in conjunction with DD 109. This material gives practical guidance to implementors until the publication of ISO/DIS 8831 which is expected in early 1986.

The UK has actively participated through BSI Technical Committee OIS/121 in the development of the ISO Draft Proposal. The Technical Committee will review any agreed amendments or addenda to the ISO text and will, where appropriate, update the text of this Draft for Development via an amendment or revision. When the ISO draft reaches an appropriate level of agreement and stability, this Draft for Development may then be converted to a British Standard.

First-time readers of this Draft for Development are advised to read the tutorial annex (annex D) before proceeding to the main text. They are also warned that this Draft for Development refers heavily to DD 109 dealing with the commitment, concurrency and recovery service and is not usable without that text.

This Draft for Development is closely related to DD 106 which specifies the basic protocol providing the service defined in this Draft for Development.

A brochure giving details of existing and projected British Standards publications for Open Systems Interconnection (OSI) may be obtained from the Sales Department, BSI, Linford Wood, Milton Keynes, MK14 6LE at no charge. Press releases for new OSI, data communications and computer graphics British Standards publications will be issued to the computing press, and details of all new publications will be recorded in full in *BSI News*.

Terminology and conventions. The text of the Draft Proposal has been approved as suitable for publication as a Draft for Development without deviation. Some terminology and certain conventions are not identical with those used in Drafts for Development; attention is drawn especially to the following.

Wherever the words 'International Standard' appear, referring to this Draft for Development, they should be read as 'Draft for Development'.

Cross-references

International standards	Corresponding British Standards
ISO 7498-1984	BS 6568 : 1984 Description of basic reference model for open systems interconnection (Identical)
ISO/DP 8571	DD 113 Open Systems Interconnection: file transfer, access and management Part 1 : 1985 General description Part 2 : 1985 The virtual filestore Part 3 : 1985 The file service definition Part 4 : 1985 The file protocol specification (Identical)
ISO/DIS 8649/3	DD 109 : 1985 Open Systems Interconnection: definition of common application service elements (CASE): commitment, concurrency and recovery (Identical)
ISO/DP 8832 (numbered ISO xxxx in the text)	DD 106 : 1985 Open Systems Interconnection: specification of the basic class protocol for job transfer and manipulation (Identical)

At the time of publication of this Draft for Development, the reference given in 2.3 is at the Draft International Standard stage and the references given in 2.2 and 2.4 are at Draft Proposal stage.



0 Introduction

The purpose of the job transfer and manipulation (JTM) standard is to provide a set of communication-related services which may be used to perform work in a network of interconnected open systems. This work can include the running of traditional jobs.

Such jobs have, in the past, been submitted either directly on the host system where they ran, or else at a remote job entry station connected to that system. Data files, program and "JCL" would be already available on the host, or would form part of the submitted "job deck". Output would be delivered on the host system, or alternatively on a printer attached to the remote job entry station. In a network of open systems, such jobs may be submitted at any open system supporting JTM to be run on another open system, using files collected from any other open systems, with output directed to peripherals or files held on any other open systems.

The JTM protocol covers not only the movement of job-related data (input and output) between open systems, but also provides for the movement of data concerned with monitoring job-related activity, and for controlling and manipulating the progress of this activity.

Annex A is part of this Standard, and describes the notation used for JTM service definition. This differs from that used by lower layers of OSI only because JTM is concerned with concurrent and related activity at more than two service access points. It is a superset of the notation used in the lower layers.

Annex B is part of this Standard, and defines the requirements for a Document Class Registration Authority. These requirements apply to private, enterprise-specific, Registration Authorities; they are, however, also expected to be satisfied by any ISO Standard covering this area.

DD 105:1985

Annex C is not part of the Standard, and contains examples of document register entries.

Annex D is a Tutorial Annex, and is not part of this Standard. It gives a broad introduction to JTM, and should be read first by readers unfamiliar with the JTM work.

Annex E is not part of the Standard, and contains an alphabetic glossary of the definitions appearing in the body of the Standard.

1 Scope and field of application

This international standard is an application layer Standard within the Open Systems Interconnection framework set up by ISO 7498.

This standard defines the concepts and services for job transfer and manipulation.

This standard requires that the user of JTM

- a) specifies the open systems where work is to be done;
- b) knows the local functions and facilities of the open systems where work is to be done;
- c) knows the job control language of the open systems where jobs are to be executed.

This standard provides the means to specify work to be done on one or more open systems. The work done at one open system may result in new work to be done at other open systems.

This standard provides the means to monitor the execution of work previously specified. This standard provides the means to modify work previously specified.

This standard does not address the standardisation of job control languages, but is also applicable to the use of a standardised job control language. This standard does not address the standardisation of user interfaces for job processing.

2 References

- 2.1 ISO 7498 Information processing systems - Open systems interconnection - Basic reference model
- 2.2 ISO 8571 Information processing systems - Open systems interconnection - File transfer, access and management
- 2.3 ISO 8649/3 Information processing systems - Open systems interconnection - Definition of common application service elements for Commitment, Concurrency and Recovery Services
- 2.4 ISO xxxx Information processing systems - Open systems interconnection - Job transfer and manipulation protocol specification

3 Definitions

Definitions are included at the head of each clause or sub-clause in which they are first used. In addition, the definitions of the following terms in ISO 8649/3 are used:

atomic action
master
subordinate
commitment
rollback

*See cross-references in national foreword (page 2).

DD 105:1985

4 Abbreviations

- 4.1 OSI: open systems interconnection
- 4.2 JTM: job transfer and manipulation
- 4.3 FTAM: file transfer, access and management
- 4.4 CCR: commitment, concurrency and recovery

5 Conventions

The conventions used in this service definition are contained in annex A.

SECTION ONE - GENERAL

6 Overview and general description

In order to define JTM services, a model of the elements involved in the JTM activity is required. This JTM model is derived from the definitions given in ISO 7498 by adding further detail to encompass job-related activity.

6.1 Overview

6.1.1 Definitions

6.1.1.1 agency: an abstract description of those functions of a local system environment which are needed to support the JTM service.

6.1.1.2 work specification: a conceptual data structure within the JTM service provider which specifies in a defined way the work which is to be done.

6.1.1.3 document: a collection of data which forms part of a work specification, and which forms a unit of interaction between the JTM service provider and an agency.

6.1.1.4 initiation agency: that agency which causes a work specification to be created.

6.1.2 Functions

The JTM model recognizes the existence of a number of independent JTM application entities on different open systems which cooperate to provide the JTM service and together form the JTM service provider. The JTM model also recognizes the existence of a number of agencies which represent the local system environment and are the users of the JTM service. The conceptual interactions between the JTM service

DD 105:1985

provider and an agency are defined by service primitives. The JTM service provider will receive from an initiation agency enough information to create a work specification.

The work which is requested will be performed by

- a) standardized functions of the JTM service provider
- b) functions of the local system environment accessed by the movement of documents between the JTM service provider and agencies.

6.2 Work specification contents

A work specification contains fields which provide data for

- a) identification of the work;
- b) authorisation of the work;
- c) defining where reports on the work are to be sent;
- d) selecting the reports which are required;
- e) identifying the type of the work specification;
- f) identifying the open systems which are to perform the work;
- g) specifying the urgency of the work;
- h) holding parts of the work until specified events occur;

- j) specifying the actions to be performed by the JTM service provider to carry out the initial work;
- k) specifying further work to be carried out when the initial work is completed.

A work specification can refer to documents in the local system environment, or can refer to documents in a remote file store which can be obtained from remote systems by the use of ISO 8571; these documents can subsequently be passed to the same or to some other local system environment for storage locally, or for remote disposal using ISO 8571. When an open system has completed the work specified by a work specification (possibly including the generation of one or more new work specifications), the work specification ceases to exist. The JTM protocol causes a work specification on one open system to be replaced by a work specification on some other open system, in order to progress the work.

The contents of a work specification relate to the following features supported by the JTM service, and are completely defined in clause 13.

The identification field of a work specification provides a universal and unique name by which the work can be referenced for subsequent reporting and manipulation. The work specification identifier is allocated when the work specification is created following submission by the initiation agency, or when it is created as the result of processing an earlier work specification. In the latter case, the identifier will reflect the parentage of the work specification.

The initiator's identity field, and the time of submission field are supplied by the JTM service provider when a work specification is created as a result of submission by the initiation agency. These fields are copied when new work specifications are created by JTM as a result of processing earlier work specifications.

DD 105:1985

The authorisation and accounting fields provide data which enables open systems to allow the performance of the requested work. When a work specification references files for obtaining or disposing of documents, additional authorisations and accounts can be included for the access to the files.

OSI job monitors can be specified; these are open systems to which any selected reports are to be sent.

The report selector field determines (for each OSI job monitor) which categories of event are to be reported to that monitor.

Different types of work specification are defined, corresponding to the different types of initial work to be performed. The most important type is the document movement work specification which provides for the movement of user documents between open systems. Other types provide for the movement of reports and manipulations: they are introduced later.

The target open system is that open system which carries out the final processing of the initial work, and which may generate new work specifications for further work.

The urgency for the performance of the desired work and the holding of it can be specified.

JTM actions specify - in relation to the various types of work specification - what specific actions the JTM service provider has to perform. They determine the interactions between the JTM service provider and its local system environment, and determine the actions to be taken by it on its own data, or with regard to the reporting of events.

The further work field provides data in a form which allows the creation of new work specifications by a target.

6.3 Proformas and spawning

6.3.1 Definitions

6.3.1.1 proforma: part of a work specification which specifies further work and is used to form a new work specification as part of the processing of earlier work.

6.3.1.2 spawning: the process of taking the data from a proforma and using it to produce a new work specification.

6.3.1.3 spawning control data: data contained in a proforma which controls the circumstances in which spawning takes place from that proforma.

6.3.1.4 top level proforma: a proforma which is not contained within any other proforma.

Note A proforma which is not a top-level proforma may become a top-level proforma as a result of spawning from its parent.

6.3.2 Functions

A proforma may contain further proformas nested to any depth. The JTM service provider will spawn work specifications using top level proformas as a result of interactions with the local system environment, using the spawning control data in the proformas. The new work specifications are formed using both data in the proformas, and also data in other fields of the original work specification. An important feature of spawning is the addition to the new work specifications of documents which have become available in the local

DD 105:1985

system environment as a result of earlier activity. The spawning process is initiated by an execution agency (see 6.4), or as the result of completion of activity on a sink or execution agency (see 6.4.1.4).

6.4 Source, sink and execution agencies.

6.4.1 Definitions

6.4.1.1 source agency: any part of an open system which can provide documents for inclusion in a work specification when required by the JTM service provider as a result of processing the work specification.

6.4.1.2 sink agency: any part of an open system to which documents can be passed by the JTM service provider as a result of processing a work specification.

6.4.1.3 execution agency: any part of an open system which initially acts as a sink for documents, but which subsequently acts as a source of related documents produced as a result of processing the earlier documents.

6.4.1.4 activity (in an agency): work performed by an agency, initiated by a service primitive issued to the agency by the JTM service provider; the completion of the activity is indicated by a service primitive issued to the JTM service provider by the agency.

6.4.2 Functions

The model recognizes that the JTM service provider, when processing a work specification, may - according to information in the work specification - interact with source, sink and execution agencies.

There are service primitives for interactions between a JTM service provider and agencies. Following these interactions with a source, the activity is complete. Following these interactions with a sink or execution agency the activity may either be complete or the agency may indicate only acceptance, that is, that the request for some activity has been secured. In the latter case, completion of the activity will be signalled by the agency at some later time, using another set of service primitive interactions.

An execution agency may, on completion of an activity, indicate that a number of documents are available for collection by a work specification resulting from spawning. It may also, at any time prior to completion, and if required by the activity, use service primitives to demand spawning using specified proformas; the resulting work specifications may collect documents which have become available before the end of the activity.

At any time prior to the completion of an activity in a sink or execution agency, the following events may occur:

- a) the JTM service provider may, as a result of processing a request for work manipulation (see 6.11), require that the activity be killed or stopped or held or released;
- b) the JTM service provider may ask for status information about the activity;
- c) the agency, if required by the activity, may cause the JTM service provider to generate a report about some significant event in the life of the activity;
- d) the agency, if required by the activity, may ask the JTM service provider to spawn from specified proformas.

DD 105:1985

All service primitives defined for interaction with an agency relate to a single work specification, and are independent of primitives used in relation to other work specifications.

It is recognized that an agency may not be able to support concurrent activity on behalf of several work specifications. In this case, the agency can reject an attempt by the JTM service provider to initiate new activity with the response "retry later".

6.5 OSI jobs

6.5.1 Definitions

6.5.1.1 initial work specification: a work specification created as a result of the issue of an initiation service primitive by an initiation agency.

6.5.1.2 OSI job the total work on all open systems arising directly or indirectly from an initial work specification.

6.5.1.3 OSI subjob (subjob): the total work arising from the processing of a single work specification, including the spawning of further work specifications, but excluding work arising from the processing of these further work specifications.

6.5.1.4 OSI job submission: the use of the initiation service primitive by an initiation agency for the creation of an initial work specification.

6.5.1.5 OSI job submission system: the open system on which OSI job submission occurs.

6.5.2 Functions

A complete OSI job may involve access to source agencies on the OSI

job submission system, access to source agencies, sink agencies and execution agencies on other open systems, the spawning of further work specifications and their processing. The complete OSI job involves a set of activities performed either consecutively or simultaneously, potentially involving many open systems.

6.6 Processing of work specifications

6.6.1 Normal processing

After OSI job submission, an initial work specification may cause one or more accesses by the JTM service provider to source agencies at the OSI job submission system together with accesses to agencies at other open systems. The processing of a work specification typically comprises the following steps, performed repeatedly if necessary:

- a) source agencies are accessed and the documents delivered by them are (conceptually) embedded in the work specification;
- b) the work specification (including any embedded documents) is replaced by a work specification at another open system, using the JTM protocol;
- c) documents within the work specification are passed to one or more sink or execution agencies as specified by the work specification;
- d) new work specifications are spawned using top level proformas contained within the original work specification, either on acceptance of documents by agencies, or on demand from an activity in an agency, or following completion of the sink or execution agency activity; documents which have been made available as a result of activity in an execution agency or which are specified to be obtained from other source

agencies may be included in the new work specifications;

- e) the work specification is destroyed when all the activity resulting from the above processing is completed.

If new work specifications have been produced by the processing of a work specification then these may cause further accesses to source agencies, followed by processing, as described above.

An illustration of the processing of a work specification, the activities of the JTM service provider related to an OSI job, including reporting (see 6.7) and manipulation (see 6.11), and the relationship between JTM model elements is given in the tutorial annex.

6.6.2 Errors in OSI job processing

The normal processing of an OSI job, as described above, involves obtaining documents from source agencies and disposing of documents to execution agencies and sink agencies. Errors may arise which prevent one or more of these document exchanges being completed successfully. For example, the work specification may contain the name of a document which does not exist in the specified source agency, or the name of a sink or execution agency which does not exist at the specified open system. Such errors are events for which JTM reports may be generated (see 6.7).

An error which prevents a document being obtained does not necessarily prevent further progress of the OSI job, as further useful processing may still be possible on other documents which have been obtained successfully. The work specification may indicate that an error diagnostic is to be included in the work specification in place of the document which could not be obtained; this error diagnostic is passed to the intended sink or execution agency instead of the document. In this case, all specified interactions with agencies still take place,

and the sink or execution agency will decide what action to take in the event of an error diagnostic being present.

An error in disposing of a document to a sink or execution agency, or in performing a JTM transfer, will prevent further processing of the OSI job. In this situation, the JTM service provider may retain the work specification for a certain period of time to allow the error to be corrected by a subsequent work specification manipulation (see 6.11). (The work specification may also specify this form of error handling when documents are being obtained from a source.) For example, an erroneous sink or source name can be changed to a correct sink or source name or an erroneous target name can be changed to a correct target name. If the error has not been corrected when the time period expires, then the JTM service provider will delete the work specification, generating an abnormal termination report (see 6.7). This ultimate action can be specified in the work specification as the immediate action on errors, and is the only error handling provided in the Basic Class subset.

Errors may also be detected when trying to create a work specification on another open system. Again, the option to wait for user correction of the error is available.

6.7 Reporting and the monitor function

6.7.1 Definitions

6.7.1.1 JTM report: encoded information recording the progress or failure of an OSI job, generated by the JTM service provider, possibly as the result of interaction with an agency.

6.7.1.2 OSI job monitors: open systems to which JTM reports about a particular OSI job are sent.

DD 105:1985

6.7.1.3 report work specification: the type of work specification created by the JTM service provider to move JTM reports; the target open system for these work specifications is one of the OSI job monitors.

6.7.2 Functions

After the JTM user submits an OSI job (through an initiation agency), he may be decoupled from it. Since, in general, it may take a long time for the complete work to be performed, the JTM user must be able to find out about the progress of the OSI job and any related work specifications. Since there might be no direct contact with the JTM user, he cannot be directly informed of the progress or failure of the OSI job. The concept of OSI job monitors is therefore introduced.

These are open systems to which report work specifications can be sent regarding the progress of the OSI job: they are specified at OSI job submission time. When a significant event occurs in the life of an OSI job, the JTM service provider may create a report and deliver it to one or more of the OSI job monitors. The originating user can either enquire from an OSI job monitor in order to discover the status of the OSI job, or can arrange for all reports to be delivered by the OSI job monitor to sink agencies of his choice. The presentation of a report in a suitable (human-readable) format is the responsibility of the sink agency, and is not standardized.

The data needed to create a report work specification, and to select events for reporting, is included in fields of the work specification being reported on.

Two forms of OSI job monitor are supported. The primary monitor (and the report categories to be sent to it) is determined by the JTM service provider at the OSI job submission system. This data can only be changed by the "management" of that open system. The secondary monitors (and the report categories to be sent to each one) are

determined by the user through parameters on the initiation service primitive. The user may change this data as the work proceeds (see 6.11).

The values inserted for the primary monitors in any actual implementation are required by the protocol specification to be configurable by local management.

The responsibility for generating reports is described in 6.15, but the OSI job submission system has to ensure that the monitor specification and the authorisation data will allow any requested reports to be delivered to the primary monitor. (The user is responsible for such actions in relation to secondary monitors; the service provider cannot guarantee delivery of reports to secondary monitors if this data is in error or becomes out-of-date.)

Report work specifications differ from other work specifications in the following respects:

- a) report work specifications do not contain any user documents; the report information is contained in them in encoded form;
- b) a report work specification is not created by spawning from a proforma; it is created from a monitor specification contained in the initial work specification;
- c) the work specification identification of a report work specification is the same as that of the work specification being reported on;
- d) the processing of report work specifications never causes further reports to be generated; errors in their processing or transfer cause them to be discarded;

DD 105:1985

- e) a report work specification contains all the permissions (see 6.13) which were present in the work specification being reported on; these are, however, ignored if any attempt is made to modify the report work specification; they are present to provide information to the OSI job monitor for handling subsequent requests for report manipulation (see 6.10);
- f) transfer of report work specifications (and manipulations - see 6.11) has priority over other JTM traffic.

The following categories of event may be selected for reporting (these categories are defined in clause 12):

- a) the creation of an OSI job;
- b) the transfer of (responsibility for) a work specification from one open system to another open system;
- c) the creation of a new work specification by spawning;
- d) the acceptance of documents by sink and execution agencies;
- e) the normal termination of a work specification following completion of the subjob;
- f) the premature ending of a subjob due to a manipulation request (STOP);
- g) the deletion of a work specification and termination of the subjob due to a manipulation request (KILL);
- h) the modification of a subjob by a manipulation request;

- j) the detection of errors in a work specification which result in error diagnostics being embedded in it;
- k) the holding of a work specification for the correction of errors;
- l) abnormal termination of the work specification due to errors;
- m) the generation of accounting information related to the subjob from the local systems environment;
- n) the generation of information by activity in an execution agency (user messages);
- p) abnormal termination of the work specification due to a request for facilities which are not supported by the class of service of this open system;
- q) an attempted modification of the work specification by a subjob lacking the necessary authorisation.

A report work specification carries one or more reports. Each report has the following parameters:

- a) the name of the open system generating the report (see 6.14);
- b) the identification of the subjob being reported on, and of its initiator;
- c) the type of event being reported;
- d) the date and time when the report was generated (optional);

- e) a non-standardised text message.

Reports for certain categories of event also carry the name of the target, the number of work specifications which were spawned, a diagnostic message, the current hold/released status, and identification of another subjob (violation attempts). The reports which carry these parameters are defined in clause 12.

6.8 Commitment, concurrency and recovery

6.8.1 Overview

In order to ensure the correct operation of the JTM service in the presence of crashes (recovery), freedom from interference by other activities (concurrency control), and the ability to perform the OSI job as one or more atomic actions (commitment), the Commitment, Concurrency and Recovery (CCR) procedures specified in ISO 8649/3 are used.

Each JTM transfer between open systems, and each interaction with an agency, uses service primitives to which the CCR semantics are applied. The procedures specified in ISO 8649/3 are carried out by each open system, and are conceptually carried out by each agency.

A Tutorial Annex in ISO 8649/3 describes the nature of CCR, for those unfamiliar with this work. An understanding of CCR is essential to an understanding of JTM.

6.8.2 Levels of commitment for JTM

In order to perform an OSI job, the JTM service uses one or more atomic actions, according to the level of commitment requested by the initiation agency. The initial atomic action starts at the point when the initiation agency submits the OSI job to the JTM service provider. (The initiation agency is the commitment master for this initial

atomic action).

The JTM service defines three levels of commitment which can be requested by the initiation agency to control the scope of this initial atomic action. As specified in ISO 8649/3, the agency specifies the minimum commitment level which it requires and is informed of the (equal or higher) commitment level actually achieved.

6.8.2.1 Completion commitment (level 3)

The highest level of commitment is COMPLETION (level 3). In this case, the entire OSI job is completed as part of the initial atomic action.

When commitment takes place, all the work specified will have been completed, and all work specifications created as part of the processing of this OSI job will have been fully processed, and will have ceased to exist.

This level of commitment is sometimes described as "on-line" processing.

6.8.2.2 Agency acceptance commitment (level 2)

The next lower level of commitment is AGENCY-ACCEPTANCE (level 2). In this case, the initial OSI subjob will have progressed at least to the point at which all specified source agencies have been accessed, and all interactions with sink or execution agencies will have resulted in the associated documents being secured by the agency, for later completion of the OSI subjob as part of subsequent atomic actions.

6.8.2.3 Provider acceptance commitment (level 1)

The lowest level of commitment is PROVIDER-ACCEPTANCE (level 1).
(This level is also applied to all atomic actions initiated after the

DD 105:1985

initial atomic action.) At this level, the initial atomic action results in the securing of the created work specification by the JTM service provider, and in it becoming visible in the open systems environment. There can be no guarantee that the specified source documents have been accessed, nor that any material has been passed to sink or execution agencies. This commitment level is always available to a user, even if the local system is currently unable to establish any form of communication with other open systems. It can be described as "off-line" processing.

6.8.3 Definition of agency actions

A source agency treats all commitment levels as requiring it to deliver the requested material (or to refuse commitment). The CCR atomic action timer indicates the time available for obtaining the material.

A sink or execution agency treats levels 1 and 2 as requiring it to at least secure the document and carry out the action later (or to refuse commitment). It treats level 3 as requiring it to complete the activity (or to refuse commitment). The CCR atomic action timer again provides the agency with an indication of the time within which these actions should be completed.

6.8.4 Timeouts

No time-outs are specified for the provision of required responses. An inability to carry out the required actions because of temporary lack of resources (congestion or concurrency control) results in local retry at that open system. The commitment master (for example, the initiation agency) may adopt a time-out on a local basis by issuing a rollback service primitive, and may use the CCR parameters to indicate this to its subordinates. Other aspects of timers are described in ISO 8649/3.

6.9 Transfer control

6.9.1 Definitions

6.9.1.1 work specification transfer: an atomic action by which a work specification is created at the receiving open system and destroyed at the sending open system.

6.9.1.2 transfer control record: a conceptual data structure held by an open system to control the transfer of work specifications and the issue of service primitives.

6.9.2 Functions

Two types of transfer control record are supported. The first is used to control which work specifications are eligible for transfer to another (specified) open system, and the number of such transfers which can be in progress simultaneously. The second is used to control the issue of service primitives by the JTM service provider to (specified) agencies, and the number of concurrent activities in the agency.

A transfer control record has no effect on the transfer of transfer manipulation work specifications (see 6.12). It can control all other types of work specification, depending on the value of the selectors.

An open system with work specifications to transfer to another open system (or to process by interaction with an agency) will, in the absence of a transfer control record for that system or agency, attempt the transfers or service indications in an order and with a degree of concurrency decided locally.

A transfer control record, if present, causes the implementation to restrict its transfer or primitive indication attempts to those needed to progress work specifications with specified characteristics.

DD 105:1985

The presence of transfer control records may prevent commitment to atomic actions. Such refusals are always flagged as "retry later".

6.10 Report manipulation

6.10.1 Definitions

6.10.1.1 report manipulation operations: operations requiring deletion or display of reports held by an open system nominated as a monitor point by some work specification.

6.10.1.2 report manipulation work specification: a work specification containing report manipulation operations.

6.10.2 Functions

A report manipulation work specification contains one or more report manipulation operations. There are two types of operations defined for report manipulation.

The first is the DELETE operation which causes deletion of all received reports about a specified OSI job or tree of subjobs. Its only parameter is a work specification identification which is used to refer to reports on the specified work specification or on any created from it.

The second is the DISPLAY operation. This has two parameters. The first is the same as above, a work specification identification used to refer to part or all of an OSI job. The second is a document name which is referenced by a proforma contained in the manipulation work specification. This proforma defines an arbitrarily complex subjob for disposal of the named document.

The action by the JTM service provider at the open system is to take each report which was received concerning the specified work specification(s), in the order in which they have been received, and to generate a document containing the reports. If two display operations specify the same document name, both displays are placed in the same document. The end of the activity produces spawning of new work specifications from proformas in the usual way: these collect the display document.

Note Where a monitor point is requested to pass reports directly to a sink agency, storage for display or deletion by report manipulation does not occur.

Authorisation for deletion of reports requires the report manipulation work specification to contain an authority corresponding to the permission information in the report work specification which delivered the report. It is a local option whether authorisation for display is also restricted in such a way. (See 6.13.)

6.11 Work manipulation

6.11.1 Definitions

6.11.1.1 work manipulation operations: operations which select one or more work specifications or proformas and request displaying, killing, stopping or modification.

6.11.1.2 work manipulation work specification: a work specification containing work manipulation operations.

6.11.1.3 selector: data which is used to select zero, one, or more work specifications.

DD 105:1985

6.11.1.4 update: data which is used to modify a selected work specification or proforma.

6.11.2 Functions

A work manipulation work specification contains one or more JTM work manipulation operations. These provide for the operations of selection, modification, killing, stopping and displaying work specifications and associated subjobs. (The effect of these operations is described below.)

The first operation must be a selection; the work specifications or proformas selected are the ones to which all operations preceding the next selection apply. The form of a work specification selector is described in 6.11.3.

The modification operation changes certain fields in a work specification or proforma. It may cause an interaction with source, sink or execution agencies associated with the work specification in order to effect hold or release on activity associated with the work specification.

The kill and stop operations are only applied to a work specification, and may also cause interactions with one or more agencies in order to stop or to kill associated activity. If an uncommitted transfer is in progress, they affect the transfer.

Killing causes the JTM service provider to delete the work specification to which it is applied, and to inform any associated agency that a kill is required. This causes the agency to cease its activity, with rollback if possible.

Stopping causes the JTM service provider to inform any associated agency that the activity is to be stopped. Normal taskend spawning will occur, and the work specification is not affected.

The display operation causes a copy of parts of the selected work specifications or proformas to be placed in a specified document. The document is collected by normal spawning as for the report manipulation display. The display also contains local status information concerning any source, sink, execution or transfer activity associated with the work specification.

Authorisation for killing, stopping, and modification requires the work manipulation work specification to contain an authority corresponding to a permission (see 6.13) in the selected work specification, or in the work specification containing a selected proforma. When an attempt is made to kill, stop, or modify one or more work specifications (selected by a selector), then the manipulation is applied only to those work specifications which contain the necessary permission, and the other work specifications are unchanged. In this case, commitment proceeds, but a CCR warning agnostic is generated. When an attempt is made to display one or more work specifications, it is a local option whether the work specifications which do not contain the necessary permission are displayed or not.

When an unauthorised modification attempt is made by subjob A (say) on a work specification B (say), this results in the VIOLATION-ATTEMPT event for B, which may be reported to one or more monitor points of B.

6.11.3 Selectors

A selector specifies a series of tests to be applied to certain fields of a work specification.

The basic tests are of the form

<u>field-name</u>	<u>operator</u>	<u>value</u>
-------------------	-----------------	--------------

DD 105:1985

where the range of permitted field names and of operations is defined in SECTION TWO.

For the purposes of selection, the important fields of a work specification are regarded as forming a somewhat simpler datastructure called a header-list. The selector selects on the basis of a general logical expression using tests for equality or inequality of these fields against specified values.

Work specifications may also be selected according to the fields of the proformas they contain.

6.11.4 Updates

An update is of the form

<u>field-name</u>	<u>operator</u>	<u>value</u>
-------------------	-----------------	--------------

and is used in the modification operation to specify the changes to be made. It is specified in SECTION TWO. Certain field names which are available for selection may not be modified.

The header-list conceptual data structure is again used for specifying the update, but changes to its fields produce corresponding changes in the associated work specification.

6.12 Transfer manipulation

6.12.1 Definitions

6.12.1.1 transfer manipulation operations: operations requiring setting, displaying or checking transfer control records.

6.12.1.2 transfer manipulation work specification: a manipulation work specification containing transfer manipulation operations.

6.12.2 Functions

A transfer manipulation work specification contains one or more transfer manipulation operations.

There are JTM transfer manipulation operations for setting, displaying and checking transfer control records.

The setting operation has a parameter which is a transfer control record.

The display operation has a parameter which identifies a transfer control record, and a second parameter which is a document name; it displays the current transfer control record in the specified document for collection by spawning.

The checking operation contains a copy of a transfer control record which the sending open system is holding in respect of transfers to the receiving open system or to an agency. The receiving open system generates a new transfer manipulation work specification containing a setting operation if this is no longer an appropriate transfer control record for the sender to be using. An open system normally issues checking operations following any period in which it is disconnected from the open systems environment.

A transfer manipulation work specification needs an authorisation element for the management of any open system referenced in the transfer control record of a setting or displaying operation, and also for the management of an open system performing a checking operation.

(See 6.13.)

6.13 Authorisation and accounting

6.13.1 Definitions

6.13.1.1 identification authority: a naming authority which issues identifications; these identifications may determine the capabilities to be made available to a particular authenticated identification (authorisation), or may be used to levy charges (accounting), or both.

6.13.1.2 authenticated identification: data which is known to correctly identify the user or management who requested the work to be performed, either by the use of a password check, or by some other checking mechanism.

6.13.1.3 user identification: data which can be used in a particular context to identify the user on whose behalf work is being requested.

6.13.1.4 account identification: data which can be used in a particular context to identify the account to be debitted with any charges which are levied.

Note User and account identifications consist of the name of an identification authority together with one of the identifications it issues.

6.13.1.5 open system management identification: the name of an open system which, when authenticated, authorises JTM activities or charging related to the management of that open system.

Note Examples of such activities are the holding of work specifications about to be transferred to it, or the setting of transfer control records.

6.13.1.6 identification authority management identification: the name of an identification authority which, when authenticated, authorises JTM activities related to control of activity initiated by user identifications issued by that authority.

6.13.2 Functions

A work specification contains authorisation data. This provides a list of authorisation elements. The authorisation element provides an open system with an identification issued by an identification authority whose name it recognises, and a validation field. The validation field is either secret data (a password or key) which serves to authenticate the identification, or is a statement that the identification has already been authenticated by an open system earlier in the history of the OSI job.

In order to accept a validation field as having been "already checked", the authenticated identification of the open system which performed the check has to be available. This is obtained in a step-wise manner. The lower layer services provide to the JTM service provider the authenticated name of a calling open system. This data is recorded in the work specification, so that it contains the name of each open system through which the work specification (or one of its ancestors) has passed. Thus an open system is able to determine, by inspection of this data, whether to accept authorisation elements claiming that an identification has already been authenticated. (The detailed operation of this procedure is specified in ISO xxxx (JTMP).) A further description (and examples), of this mechanism appears in the Tutorial Annex.

An authorisation element may identify a user, or the management of an identification authority, or the management of an open system.

DD 105:1985

The authenticated identification is used to authorize any activity which is requested, and may, in the absence of a suitable account element (see below), also be used to levy charges.

A work specification may also contain account data. This provides a list of account elements. An account element provides an open system with an account identifier issued by an identification authority whose name it recognises, and a validation field.

The authorisation data also names the user identifications which are given permission to make modifications to this work specification. Implicit permission is given to validated identifications representing the identification authority management issuing these identifications, and to those representing the open system management for open systems involved in the OSI job.

An open system's local management will decide whether to allow queries and status displays about a work specification without the existence of a permission, or whether to treat a work specification as invisible to anyone other than those with permission to modify it.

(Implementations are required to be configurable for this aspect of their operation.)

Permission to modify a transfer control record is implicitly given to authenticated identifications representing the open system managements involved.

Arrangements between open systems for use of a common identification authority are not excluded, but are not required.

6.14 Work specification identification

6.14.1 Definitions

6.14.1.1 OSI job local reference: a reference for an OSI job unique

within the OSI job submission system, assigned by that open system.

6.14.1.2 initiating user: an identification provided by the JTM service provider at submission time to identify the initiator of the OSI job.

6.14.1.3 OSI job name: a string provided by an initiation agency when submitting an OSI job.

6.14.1.4 work specification identifier: a unique reference for a work specification which includes the name of the OSI job submission system, the identification of the initiating user, the OSI job local reference and the OSI job name; where a work specification was created by spawning, the identifier also contains one or more proforma names.

6.14.2 Functions

The work specification identifier provides a unique name by which the work specification can be referenced by a report or by a manipulation work specification.

The first part of a work specification identifier is the name of the OSI job submission system followed by the identification of the initiating user, the OSI job local reference and the OSI job name. The second part of the identifier is a list of (proforma name, qualifying integer) pairs. An element is added to the list whenever a new work specification is created by spawning. The proforma name is the name of the proforma used to spawn the work specification, and the qualifying integer is used to distinguish between work specifications spawned from the same proforma.

In summary, all work specifications have an identification known as the work specification identifier. A complete OSI job, that is the set of all its work specifications, can be referenced by quoting the name of the OSI job submission system and either

DD 105:1985

- a) the initiating user identification and OSI job-name;
or
- b) the OSI job local reference.

An individual subjob can be referenced by quoting a complete work specification identifier. A group of subjobs with a common origin can be referenced by quoting the work specification identifier of their origin.

6.15 Reporting responsibility

Reports may be generated either as part of the CCR atomic action progressing the work (and with the same commitment level) - integral reporting, or as part of a separate atomic action - separate reporting. In the former case they will be committed if and only if the atomic action proceeds to commitment. When generated by a commitment master, they are either not generated before commitment is offered, or are rolled-back if the main action is rolled back (as an implementors option).

In the latter case, they are generated as a result of progressing the main action, and are not affected by rollback of that action.

6.15.1 Separate reporting

Reports issued as separate atomic actions are

- a) reports of accounting information;
- b) reports of attempted security violations;
- c) reports of the failure of an atomic action, resulting in no progress of a work specification, or in its abnormal termination.

6.15.2 Integral reporting

Reports which are committed only if the main action commits are:

- a) reports that J-INITIATE has created a new work specification;
- b) reports that spawning of a new work specification has occurred;
- c) reports that another open system has taken responsibility for progressing a work specification in a subsequent atomic action;
- d) reports that AGENCY ACCEPTANCE for the subjob has occurred;
- e) reports that an error diagnostic has been included in a work specification (for delivery to a sink agency) in place of a document;
- f) reports carrying messages produced during processing activity (and passed to JTM by a J-MESSAGE request from an execution agency);
- g) reports of normal termination of a subjob;
- h) reports of termination of a subjob, or of modification as a result of manipulation by another work specification (see section 6.11).

6.15.3 Responsibility for separate reporting

Responsibility for issuing reports which are issued as separate atomic actions is

DD 105:1985

- a) for accounting information, that open system which levies the charges or debits an allocation; the number and frequency of such reports is not Standardised;
- b) for attempted security violations, that open system with responsibility for the work specification being manipulated;
- c) for reports of failure of an atomic action, that open system containing the master of the atomic action; (note that where the master is a JTM agency, the report is generated by the JTM service provider accessing the agency); diagnostic messages are carried to the master by the normal CCR mechanisms (the diagnostic parameter on C-REFUSE).

6.15.4 Responsibility for integral reporting

Responsibility for integral reporting rests with the open system most closely involved, thus:

- a) for creation, the open system where the J-INITIATE is issued;
- b) for spawning, the open system performing the spawning;
- c) for transfer of responsibility, the open system taking responsibility;
- d) for AGENCY ACCEPTANCE, the open system where the J-INITIATE service primitive is issued;
- e) for error diagnostic embedding, the open system performing the embedding;

- f) for user messages, the open system where the J-MESSAGE service primitive was issued;
- g) for normal termination, the open system containing the master of the atomic action which completes the subjob;
- h) for manipulation termination, the open system performing the manipulation (and responsible for the work specification being manipulated).

6.15.5 Job tracing

The reporting categories of JTM have been designed to permit a sufficiently sophisticated monitor point implementation to maintain a "picture" of the progress of an OSI job, providing it receives all reports in certain categories.

Such job tracing is not required of an implementation by the JTM Standard, and can be performed on a purely manual basis. On the other hand, highly sophisticated JTM implementations are not excluded.

The minimum relevant report categories are:

- a) creation reports, indicating the creation of a new OSI job, with its identification, and the open system responsible for it;
- b) spawning reports, indicating the activation of a new subjob, with its identification, and the open system responsible for it;
- c) transfer of responsibility, indicating a change in the open system responsible-for progressing a subjob;

DD 105:1985

- d) normal, abnormal, and manipulation termination, indicating the end of a named subjob.

It can happen that, due to congestion or long-term network failures, some reports are delayed. In general, reports may arrive out of order. The correct order of the above categories can be deduced from the identifications of the subjobs.

Ambiguity arises only when all subjobs appear to have ended, but reports of prior spawning have been delayed. The JTM service enables this ambiguity to be resolved by including with all termination reports a count of the number of subjobs which were spawned.

The JTM service does not provide any mechanism for deducing, on receipt of a subjob termination report, that all reports of accounting information, attempted security violations, error diagnostic insertion, and user messages have been received.

6.15.6 Additional state information

The above list of reporting categories is the minimum needed to determine the current location and states of the parts of an OSI job. Useful additional information is provided by:

- a) reports of AGENCY ACCEPTANCE;
- b) reports of holding and release of a work specification by modification or on "no-progress".

6.16 Documents

JTM defines four forms of Standardised document which carry JTM information. These are JTM report documents (defined in 14.1), JTM report display documents (defined in 14.2), JTM transfer-display documents (defined in 14.3), and JTM work-display documents (defined

in 14.4).

The semantics of these documents are fully defined in this Standard, and a transfer syntax for such documents is fully defined in the JTM protocol Standard.

In addition to these forms of document (which are generated by the JTM service provider), the JTM service is also capable of carrying any form of user document for which a transfer syntax has been defined. The definition of the syntax and semantics of other classes of document is outside the scope of the JTM Standard, but is essential to its use.

JTM recognises three sorts of document class. These are

- a) the JTM-generated document classes, these are the four classes listed above; and
- b) Standardised document classes; these are document classes whose semantics and transfer syntax have been defined elsewhere, and for which there is an entry in the ISO Register of Document Classes; and
- c) Enterprise-specific document classes; these are document classes whose semantics and transfer syntax are determined on an enterprise-specific or bilateral basis.

The JTM protocol static conformance clause requires certain JTM implementations to provide support for the three simplest forms of document, designed to carry simple lines of text (TEXT document), text with carriage controls (PRINT document), and an arbitrary length string of bits (BINARY document).

DD 105:1985

These documents are defined in Annex B pending the establishment of an ISO Document Class Registration Authority.

There are no JTM conformance requirements in relation to support for other document classes such as those defined for graphical transfers, office documents, or data descriptive files. Support by JTM implementations for such document classes is optional.

Notes

(1) Annex A defines the information required in a Document Class Register Entry for the registration or distribution of definitions of enterprise-specific document classes.

(2) Annex B defines nine document classes which can be used on an enterprise-specific basis prior to the establishment of the ISO Register. It is recommended that the document class identifiers allocated in Annex B should not be used for any other class of document. This Annex will be withdrawn at some future date.

(3) The four JTM document classes are listed in Annex B so that they can be carried by other carriers, such as FTAM, and to identify the documents in JTM transfers.

7 Overview of the service

The JTM service primitives defined in SECTION TWO of this standard are specified in terms of the model elements described in clause 6. These JTM service primitives provide for performing all job-related activities between open systems.

They provide for

- a) the submission of an OSI job to the JTM service

provider from an initiation agency; (OSI jobs may be submitted to move documents between source, sink and execution agencies; OSI jobs may also be submitted for display or manipulation of any previously submitted OSI jobs, that is, to display and modify the actions of the JTM service provider or the current activities of agencies);

- b) the delivery of documents to sink agencies, together with an interaction about the end of the activity caused by the delivery;
- c) the collection of documents from source agencies;
- d) the delivery of documents to execution agencies for processing, together with an interaction about the end of the activity of the agency caused by the delivery.

8 Basic and full classes

Note: A complete description of Basic class JTM services is given in SECTION THREE

The subdivision of the JTM services into classes aims to facilitate the implementation of the JTM system in cases where, for a specific requirement, only a limited functionality is needed.

In the Basic Class, a JTM implementation will support only a restricted form of work specification. The following restrictions apply to all work specifications passed to or created at Basic Class systems:

- a) the work specification contains at most one top-level proforma;

DD 105:1985

- b) the proforma contains no embedded proformas;
- c) the only categories of event which can be selected for reporting are abnormal termination and manipulation termination;
- d) there are no secondary monitors;
- e) manipulations are supported only for operations to
 - 1) stop an OSI subjob;
 - 2) kill an OSI subjob;
 - 3) display on OSI subjob.
- f) only AGENCY-ACCEPTANCE and PROVIDER-ACCEPTANCE levels of commitment are supported.
- g) the work which can be specified is restricted, as defined in SECTION THREE.

The Full Class contains the full set of functions as described in this standard.

Basic Class JTM protocol is a subset of the Full Class JTM protocol. Open systems providing the full functionality are able to communicate with open systems supporting only the Basic Class, provided that those work specifications which form part of the OSI job and which are transmitted to Basic Class systems satisfy the Basic Class restrictions defined in SECTION THREE.

9 Model for the service specification

JTM services are provided by JTM application layer entities which

together constitute the JTM service provider. The JTM services are described in relation to and in terms of the JTM model elements which have been described earlier.

The service primitives represent conceptual interactions between the JTM service provider and the different agencies in the model (that is, initiation, source, sink and execution agencies, constituting the users of the service).

According to further specific JTM mechanisms, such as spawning of new work specifications from proformas, a service request from one user may give rise to a set of interactions between the JTM service provider and agencies. This constitutes a one-to-many correspondence between JTM service users. (See Figure 9-1.)

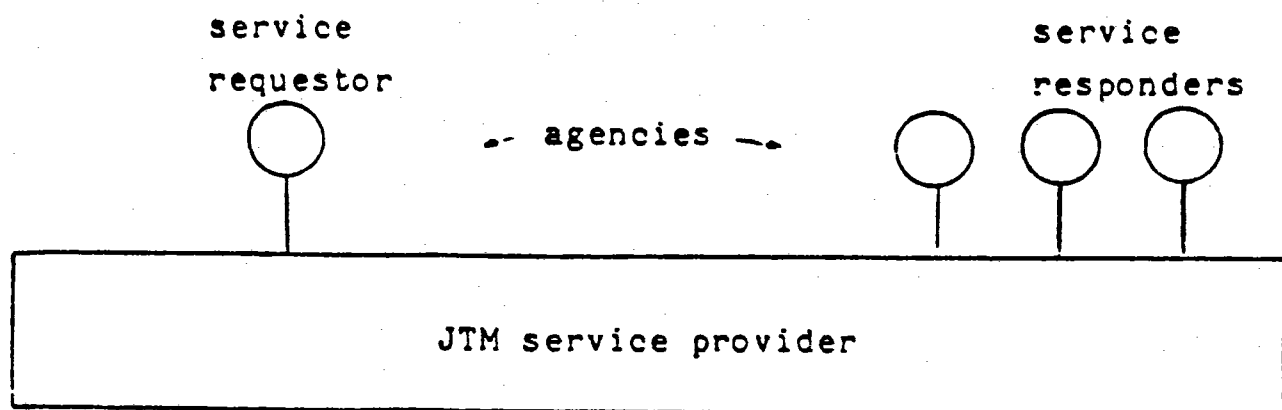


Figure 9 - 1

DD 105:1985

An initiation agency interacts with the JTM service provider to provide all the information necessary to define an initial work specification with its proformas (that is, the whole work to be performed), and there are service primitives related to this.

The main unit of interaction between the JTM service provider and sink, source and execution agencies is the document, and a set of service primitives is provided to support these interactions for any class of document.

Another set of service primitives relate to the manipulation of work specifications.

Finally, there are a set of service primitives related to the monitoring and status concepts in the JTM model.

All these service primitives are defined in SECTION TWO. A summary is given at the end of that section. The name of each service primitive has been chosen to be in line with the concepts of the JTM model, and relates to a specific interaction between a specific agency and the service provider. Several of these service primitives are needed to describe the complete processing of a single OSI job.

SECTION TWO - DEFINITION OF PRIMITIVES

10 USE OF THE SERVICE PRIMITIVE CONCEPT

An agency provides an abstract representation of part of a real open system.

Each conceptual interaction between the JTM service provider and an agency is defined by the issue of a sequence of service primitives (called a JTM service primitive group or a commitment group).

This Standard specifies the application of Commitment, Concurrency, and Recovery semantics to these service primitives as defined in ISO 8649/3. This provides a means of defining the points in the JTM protocol when externally visible events must occur, and of stating the commitment, concurrency, and recovery capability which the total real system must exhibit.

Provided the external behaviour corresponds with that of the model open system, no constraints are placed on the internal structure, interfaces, or procedures of the real system.

10.1 Service primitive groups

A JTM service primitive group is a sequence of service primitives, some of which are mapped onto the C-service primitives of ISO 8649/3, and some of which have a purely JTM function.

10.1.1 Creation of new work specifications

There are four groups of primitives (initiated by an initiation agency) which each define the creation of a new work specification in an Open System. These are:

DD 105:1985

- J-INITIATE-WORK** this group allows an initiation agency to create a work specification for document movement;
- J-INITIATE-WORK-MAN** this group allows an initiation agency to create a work specification for the manipulation of existing work specifications;
- J-INITIATE-REPORT-MAN** this group allows an initiation agency to create a work specification for the manipulation of reports received by an OSI job monitor;
- J-INITIATE-TCR-MAN** this group allows an initiation agency to create a work specification for manipulation of JTM transfer control records;

Note that where a statement applies to all the above primitive groups, the term "J-INITIATE" is used. In particular, the only difference between the parameters of these primitives is in the nature of the JTM action parameters outside of proformas, and the Basic Class restrictions.

10.1.2 Document movement

There are three groups of primitives initiated by the JTM service provider as the result of processing a document movement work specification, that is, as the result, directly or indirectly, of a J-INITIATE-WORK group of primitives. The first group is issued to a sink or execution agency, and the last two groups to an execution agency or source. These groups are:

- J-DISPOSE** this group allows the JTM service provider to pass a document to a sink or execution agency, creating a new activity in that agency;