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AND LEASED CIRCUITS

International transport network

**Performance objectives, allocations and limits
for bringing-into-service and maintenance of in-
ternational atm virtual path and virtual channel
connections**

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PERFORMANCE OBJECTIVES, ALLOCATIONS AND LIMITS FOR BRINGING-INTO-SERVICE AND MAINTENANCE OF INTERNATIONAL ATM VIRTUAL PATH AND VIRTUAL CHANNEL CONNECTIONS

Summary

This Recommendation provides performance objectives, allocations and limits, and measurement procedures for bringing-into-service and maintenance of international end-to-end permanent and semi-permanent ATM Virtual Path Connections (VPCs), Virtual Channel Connections (VCCs), and connection portions that form part of an international ATM VPC or VCC. Error, delay and availability performance aspects are addressed. Some of the performance objectives depend on the user's selection of Quality of Service (QoS) class, definitions of which are given in Recommendations I.356 and I.371.

Introduction

This Recommendation describes the operational procedures and performance of ATM VPCs that are designed and engineered according to the relevant I-series Recommendations, and are used to support ATM VCCs. It relies heavily on the use of in-service monitoring facilities built into ATM equipment, and focuses on the F4 and F5 Operations, Administration and Maintenance (OAM) information flows specified in Recommendation I.610. However, these OAM facilities are not present in all types of ATM equipment. Therefore, Out-Of-Service (OOS) tests will also be required to ensure operational performance limits are met during Bringing-Into-Service (BIS) and maintenance activities.

The long-term (one month) cell transfer and availability performance objectives for ATM networks are defined in Recommendations I.356 and I.357 respectively. Short-term cell transfer and availability performance requirements from an operation and maintenance perspective are covered in this Recommendation.

I.356 and M.2201 apply end-to-end from terminal measuring point MPT to MPT. This Recommendation enables the derivation of the performance objectives for real connections according to ITU-T Recommendation I.356 (which has a country-based model); the performance allocation to a single operator is not specifically addressed. In cases where multiple operators operate one or more connections/portions, the subdivision of the objectives between them is subject to further study.

This Recommendation is part of the M.22xx-series that address the operation and maintenance of the ATM layer (i.e. above the physical layer). It does not address the ATM Adaptation Layer (AAL) services or consider provisioning and commissioning of ATM equipment into the network. Recommendations in the M.21xx series provide performance objectives, allocations and limits for the physical layer network supporting the ATM layer. The built-in monitoring used by these Recommendations is the OAM information flows defined in I.610 as F1, F2 and F3.

Keywords

Availability	Errored Second	Performance Limits
Bringing-Into-Service	In-Service Monitoring	Severely Errored Second
Degraded Performance Limit	Performance Allocation	Unacceptable Performance Limit

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PERFORMANCE OBJECTIVES, ALLOCATIONS AND LIMITS FOR BRINGING-INTO-SERVICE AND MAINTENANCE OF INTERNATIONAL ATM VIRTUAL PATH AND VIRTUAL CHANNEL CONNECTIONS

1 Scope

This Recommendation provides performance objectives, allocations and limits, and measurement procedures for bringing-into-service and maintenance of international, permanent or semi-permanent end-to-end ATM Virtual Path Connections (VPCs), Virtual Channel Connections (VCCs), and connection portions that form part of an international ATM VPC or VCC. Error, delay and availability performance aspects are addressed.

This Recommendation provides performance objectives, allocations and limits for Bringing-Into-Service (BIS) and maintaining international ATM permanent and semi-permanent VPCs that are transported over PDH, SDH or optical fibre networks, referring to the Operations, Administration and Maintenance (OAM) information flows F1-F5 (see Figure 3/I.610 [7]). This Recommendation is part of the M.22xx-series, which address flows F4 and F5 (i.e. above the physical level); the M.21xx-series address flows F1-F3. This Recommendation does not address the ATM Adaptation Layer (AAL) services or consider provisioning and commissioning of ATM equipment into the network.

Because BIS and maintenance requirements differ according to cell priority level, different limits are provided based on Cell Loss Priorities CLP=0, and CLP=0+1. Performance parameters and limits are also given for triggering maintenance activity (e.g. fault localisation, repair etc.). Automatic re-routing of cells in the case of a fault is assumed in the determination of limits. The limits are designed to support the long-term performance objectives in Recommendation I.356 [4].

This Recommendation assumes the ATM cell format and structure described in Recommendation I.150 [1] and the use of Recommendation I.610 [7] B-ISDN OAM principles and functions. Methods of deriving performance information from OAM cells and other path information are given.

This Recommendation enables the derivation of the performance objectives for real connections according to ITU-T Recommendation I.356 [4] (which has a country-based model); the performance allocation to a single operator is not specifically addressed. In cases where multiple operators operate one or more connections/portions, the subdivision of the objectives between them is subject to further study.

2 References

The following ITU-T Recommendations contain provisions which, through reference in this text, constitute provisions of this Recommendation. All Recommendations are subject to revision; all users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations listed below. A list of the currently valid ITU-T Recommendations is published regularly.

- [1] ITU-T Recommendation I.150, *B-ISDN ATM functional characteristics*
- [2] ITU-T Recommendation I.326, *Functional architecture of transport networks based on ATM*

- [3] ITU-T Recommendation I.353, *Reference events for defining ISDN and B-ISDN performance parameters*
- [4] ITU-T Recommendation I.356, *B-ISDN ATM layer cell transfer performance*
- [5] ITU-T Recommendation I.357, *B-ISDN semi-permanent connection availability*
- [6] ITU-T Recommendation I.371, *Traffic control and congestion control in B-ISDN*
- [7] ITU-T Recommendation I.610, *B-ISDN operation and maintenance principles and functions*
- [8] ITU-T Recommendation M.20, *Maintenance philosophy for telecommunication networks*
- [9] ITU-T Recommendation M.34, *Performance monitoring on international transmission systems and equipment*
- [10] ITU-T Recommendation M.60, *Maintenance terminology and definitions*
- [11] ITU-T Recommendation M.2100, *Performance limits for bringing-into-service and maintenance of international PDH paths, sections and transmission systems*
- [12] ITU-T Recommendation M.2101, *Performance limits for bringing-into-service and maintenance of international SDH paths and multiplex sections*
- [13] ITU-T Recommendation M.2140, *Transport network event correlation*
- [14] ITU-T Recommendation M.3010, *Principles for a Telecommunications Management Network*
- [15] ITU-T Recommendation M.3200, *TMN management services and telecommunications managed areas: overview*
- [16] ITU-T Recommendation M.3207.1, *TMN management service: maintenance aspects of B-ISDN management*
- [17] ITU-T Recommendations M.3400, *TMN management functions*
- [18] ITU-T Recommendation M.3600, *Principles for the management of ISDNs*
- [19] ITU-T Recommendation M.3610, *Principles for applying the TMN concept to the management of B-ISDN*
- [20] ITU-T Recommendation M.3611, *Test management of the B-ISDN ATM layer using the TMN*
- [21] ITU-T Recommendation O.191, *Equipment to assess ATM layer cell transfer performance*

3 Terms and definitions

General terms and definitions relating to this Recommendation are provided in Recommendations I.326 [2], I.353 [3], I.356 [4], I.357 [5], I.371 [6], I.610 [7], M.20 [8], M.34 [9], M.60 [10], M.2100 [11] and M.2101 [12]. For the purpose of this Recommendation, the following definitions also apply:

Allocated Performance Objective (APO): An APO is the PO for a real connection calculated according to the allocation rules defined in this Recommendation.

Bringing-Into-Service Performance Objective (BISPO): A BISPO is the PO for a real connection or connection portion calculated from its APO and used for BIS testing