



**Network Data Management – Usage
(NDM-U)
For
IP-Based Services
Service Specification –
Wholesale**

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Preface

Contacts

For general questions regarding this document and referrals to technical experts for detailed questions, please contact:

Chief Editor: Steve Cotton
Cotton Management Consulting
scotton@compuserve.com

Architecture Working Group –

Lead: Raghu Dhulipala
Convergys Corporation
raghu.dhulipala@convergys.com

Editor: Aron Heintz
RateIntegration, Inc.
aheintz@rateintegration.com

Business Requirements Working Group –

Lead: Kelly Anderson
SCC Communications Corp.
kanderson@sccx.com

Editor: Pat Walls
TSI
Telecommunication Services Inc.
pwalls@tsiconnections.com

Protocol Working Group

–

Lead: Jeff Meyers
HP
jeffm@cup.hp.com

Editor: Ken Sarno
NARUS, Inc.
kensarno@narus.com

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Abstract

This document is a companion to NDM-U, which specifies the overall business requirements and protocol generic to all services. The content herein is compliant to those requirements and specifications and is particular to the service specified.

Change History

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1. Introduction

1.1. Purpose

This document is intended to specify the business use case and formal XML Schema for the IP-based service.

1.2. Scope

This document is limited to the discussion of issues as defined by the mission statement of IPDR.org, namely:

The IPDR Organization (the “Organization”) is organized and operates as a non-stock not for profit organization for the following purposes:

- (a) To develop, agree upon and publish a non-proprietary, open specification for the representation and encapsulation of Internet Protocol (IP)-based events for use by business, operations and decision support systems. Such events include, but are not limited to, IP-based network services, application services and e-commerce transactions;*
- (b) To develop, agree upon and publish a non-proprietary, open specification for the representation and encapsulation of IP-based network and service elements provisioning events;*
- (c) To promote work accomplished and uniform specifications to the industry and submit approved published specifications to the appropriate standards bodies for acceptance in the public domain;*
and

To have and exercise all powers necessary or convenient to affect any or all of the purposes for which the Organization is organized.

1.3. Compatibility

Future revisions are expected to make every attempt to preserve investments made by service providers and solution vendors by considering backward and forward compatibility whenever it is practical.

1.4. References

- [1] NDM-U 2.5, IPDR.org.
- [2] XML Schema Part 1: Structures, W3C Working Draft 7 April 2000.
- [3] XML Schema Part 2: Data Types, W3C Working Draft 7 April 2000.

1.5. Overview

This specification is divided into two major chapters:

- Service Specification – description of the specific requirements and business use case for the service in question.
- Formal Specification – XML Schema description of the IPDR Record for this service.

1.6. Terminology and Glossary

Terminology

Term	Definition
Accounting	The process of collecting and analyzing service and resource usage metrics for the purposes of capacity and trend analysis, cost allocation, auditing, and billing, etc. Accounting management requires that resource consumption be measured, rated, assigned, and communicated between appropriate business entities.
Mediation	In view of network reference model, Mediation refers to the combination of the logical entities IPDR recorder, IPDR transmitter, and IPDR store.
Resource	A quantifiable asset employed by a Service Provider , or on behalf of a Service Provider by another Service Provider, to fulfill a request of a Service Consumer . (Examples include: files, communications, goods, etc).
Roaming	Service usage initiated by a service consumer and provided by a service provider other than the one with which the service consumer have business relationship.
Service	Network and/or application operation that provides the Service Consumer with the requested resource .
Service Consumer	The beneficiary (human or system) of a service .
Service Element	Any element that is responsible for fulfilling a Service Consumer request. (Examples include: network equipment and system processes)
Service Provider	An enterprise that provides communications-based services .
Session	A set of related service usages; service usages may or may not be time based in the unit of measurement.
Usage	Consumption of resources and services by a Service Consumer .
Usage Attribute	A parameter whose value indicates some aspect of usage of a given service and/or resource .
Usage Entry ¹	A Service -specific trigger resulting in the generation by a Service Element of a set of Usage Attribute values related to Usage specific to a given Service Consumer

¹ Because of legacy issues, a Usage Entry from a given Service Element will not initially conform to an IPDR specification or, in some cases, may never conform. To be considered a Usage Entry the information presented or made available by inference from the Service Element must minimally contain attributes from some of the general attribute categories.

Glossary:

ANI	- Automatic Number Identification
ASP	- Application Service Provider
BSS	- Business Support Systems
CRM	- Customer Relationship Management
DSS	- Decision Support Systems
DTD	- Document Type Definition
DSL	- Digital Subscriber Line
EP	- End Point
ESN	- Electronic Serial Number
FoIP	- Fax over IP
GK	- Gate Keeper
GPRS	- General Packet Radio Service
IETF	- Internet Engineering Task Force
IMSI	- International Mobile Subscriber Identity
IP	- Internet Protocol
IS	- IPDR Store
ISDN	- Integrated Services Digital Network
ISP	- Internet Service Provider
IT	- IPDR Transmitter
NDM	- Network Data Management
NSE	- Network Service Element
OSS	- Operations Support System
PLMN	- Public Land Mobile Network
PSTN	- Public Switched Telephone Network
QoS	- Quality of Service
RADIUS	- Remote Access Dial-In Usage Server
RAS	- Remote Access Server
SC	- Service Consumer
SE	- Service Element
SMS	- Short Message Service
SP	- Service Provider
TMF	- TeleManagement Forum
TOM	- Telecommunications Operations Map
UA	- Usage Aggregators
UC	- Usage Collectors
VoIP	- Voice over IP
VPN	- Virtual Private Network
WAP	- Wireless Application Protocol
xDSL	- Digital Subscriber Line of type x
XML	- eXtensible Markup Language

2. Wholesale Specification

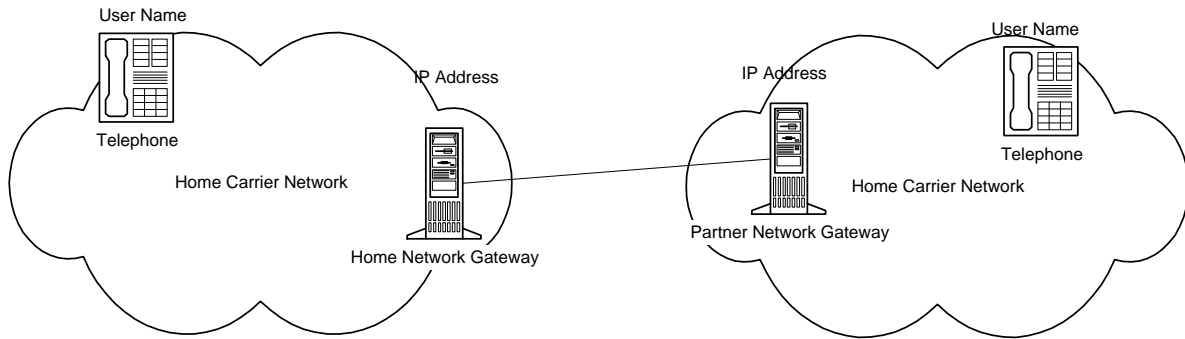
2.1. Definition

In all services of voice and data more than one service provider may be involved. In such cases the service provider who provides the service charges his partner (another service provider) for the service. The charges are calculated according to the data captured from the system's records during the period. The basic step in wholesale billing is the guiding of the record to the relevant partner.

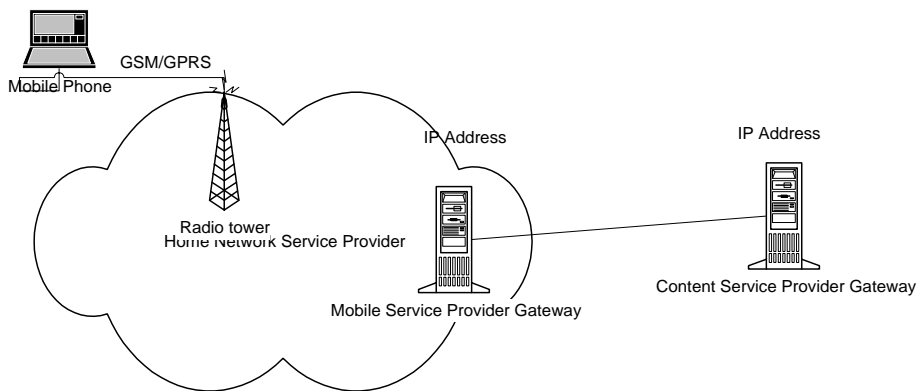
The requirements here are the same across all products using the TCP/IP protocol, for example:

VoIP - Using VoIP will require both end service providers to communicate over IP. Thus there are origination and destination IP addresses.

Even when user names are used to initiate the calls the service providers must use IP address to communicate the other parties. These IP address can uniquely identified the service providers.



WAP - When this service is used the user connects to a WAP gateway using a cellular phone. The connection between the WAP Gateway (or other server of the service provider) to the content provider is done using IP.



Two approaches can be used for guiding record to the correct partner, the approaches are described below.

2.1.1. Requirements

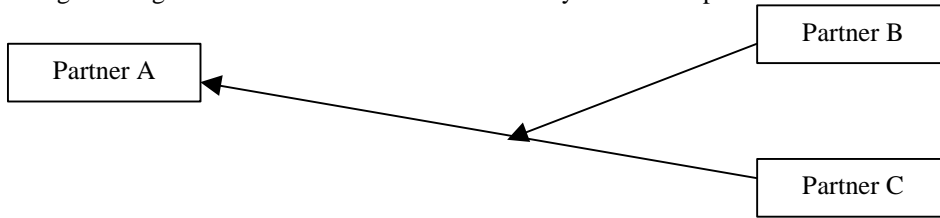
2.1.2 Usage Attribute List

2.2 Use Case

2.2.1 Basic Flow

Approach 1

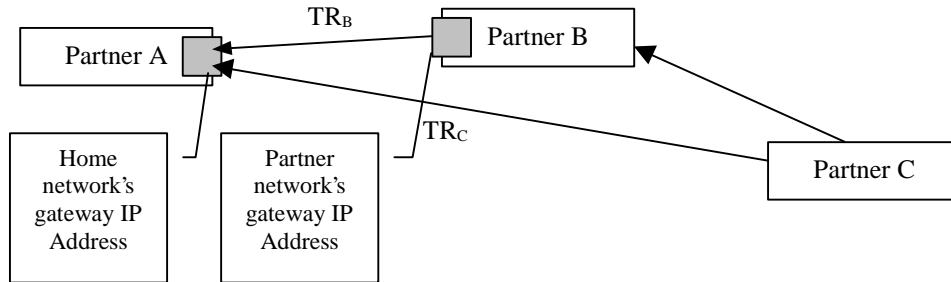
Using the Origination/Destination number to identify the service provider.



Partner A connects to both Partner B and Partner C.
 Partner A receives data from Partner B.
 Partner A receives data from Partner C.

Approach 2

Using gateway's identification of the closed network.



Partner A connects to both Partner B and Partner C.
 Partner C sends data to Partner A directly or through Partner B.
 Partner A settles with Partner C on the direct connection and with Partner B on all the data received on TR_B (including data received from Partner C through Partner B).

2.2.1.1 Basic Flow

IPDR must provide unique identifier of the source and destination partner.
 IPDR must provide identification of the network of the closed partner. This identifier can be the IP address of the router of the closed partner.

2.2.1.2 Basic Flow Usage Attribute List

Category	Usage Attribute Name	Data Type	Presence	Possible Values	Remarks
Who	Origination IP Address	String	Required		
Who	Home Gateway	String	Required		

Category	Usage Attribute Name	Data Type	Presence	Possible Values	Remarks
	IP Address				
Who	Partner's gateway IP Address	String	Required		The partner's gateway that connected to the home service provider.
Where	Destination IP Address	String	Required		

3.0 Formal Specification

3.1 Schema

```

<?xml version = "1.0" encoding = "UTF-8"?>
<!--Generated by XML Authority. Conforms to w3c http://www.w3.org/2000/10/XMLSchema-->
<schema xmlns = "http://www.w3.org/2000/10/XMLSchema"
  targetNamespace = "http://www.ipdr.org/namespaces/ipdr"
  xmlns:ipdr = "http://www.ipdr.org/namespaces/ipdr"

  version = "2.5-A.0">
  <annotation>
    <documentation>
      Referring to a local copy will normally yield significantly faster performance.
      The name of the master IPDR schema file can either be:

      http://www.ipdr.org/public/ipdr2.5.xsd

      Alternatively, it can be a local copy of this file.
      Please modify the preceding "include schemaLocation" appropriately.
    </documentation>
    <documentation>This is the master IPDR schema file for Wholesale
Services</documentation>
    <documentation>The master service description documentation _SHOULD_ be found at:
      http://www.ipdr.org/public/NDM-U-ver-2-5-XXXXX-Cx.doc</documentation>
  </annotation>
  <include schemaLocation = "ipdr2.5.xsd"/>
  <complexType name = "wholesaleType">
    <complexContent>
      <extension base = "ipdr:SCType">
        <sequence>
          <element name = "subscriberId"/>
          <element name = "ipAddress"/>
        </sequence>
      </extension>
    </complexContent>
  </complexType>
  <element name = "originationIPAddress" type = "string"/>
  <element name = "homeGatewayIPAddress" type = "string"/>
  <element name = "partnerGatewayIPAddress" type = "string"/>
  <element name = "destinationIPAddress" type = "string"/>
</schema>

```

3.2 Sample Instance Document