网络与通信技术影印版系列

Internet Open Trading Protocol

互联网开放贸易协议

David Burdett

Donald E.Eastlake III

Marcus Goncalves

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INTERNET OPEN TRADING PROTOCOL

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To my irreplaceable wife Catherine for putting up with me trying to explain IOTP, and my daughter Anna-Louise who provides unending love and support, and finally to my former employers, Mondex International, without whose support in the early days, IOTP would probably not have happened.

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Marcus Goncalves

PREFACE

The Internet Open Trading Protocol: Enabling Global E-Trading

The myriad existing Internet commerce protocols are endangering the development and healthy growth of the Internet commerce. In order to establish common ground, the Internet Engineering Task Force (IETF, www.ietf.org) has formed a working group to publish and develop new versions of a protocol intended to encapsulate a variety of payment systems. This protocol, known as the Internet Open Trading Protocol (IOTP), started in an Industry Consortium before transfer to the IETF. It provides an interoperable framework for Internet commerce. Being payment system–independent, IOTP will be able to encapsulate payment systems such as SET, Mondex, CyberCoin, DigiCash, GeldKarte, etc.

IOTP is designed for consumer-to-business and consumer-to–financial institution transactions such as purchase, refund, deposit, and withdrawal of electronic cash, etc. IOTP adopted the eXtensible Markup Language (XML) as a data representation language because it is platform-independent, makes IOTP more flexible and extensible, and facilitates the development of IOTP-aware applications. The IETF Trade Working Group is developing the next version of the IOTP specification.

This book, based on the IETF documents, is not only important, since it introduces the technical community to IOTP, but it's also very timely, as e-commerce advocates are searching for solutions that enable the handling of multicomponent electronic commerce systems. IOTP is able to handle cases in which such roles as the merchant, the payment handler or cash register, the deliverer of goods or services, and the provider of customer support are performed by different parties or by the same party. Thus, this book not only proposes to introduce and discuss a very new (and needed) Internet technology, but to make sense of it.

The professionals most likely to take advantage of this book are:

- Computer-literate professionals who graduated a few or more years ago, concerned with the turns and advances electronic commerce is taking

- Programmers/analysts/software developers, engineers/test engineers, programmers, and project managers
- MIS and IS&T (Information Systems and Technology) professionals
- Professionals involved with setting up, implementing, and managing extranets and virtual stores
- Webmasters
- Entry-level (in terms of computer literacy) professionals who want to understand an example of how the Internet works and Internet commerce develops
- Advanced computer-literate people who would use the book as a quick reference book

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David Burdett (David.Burdett@commerceone.com) of Commerce One, Donald Eastlake 3rd (Donald.Eastlake@motorola.com) of Motorola, and Marcus Goncalves (MGoncalves@arcweb.com) of ARC Advisory Group

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CHAPTER 1

An Overview of the Internet Open Trading Protocols

Introduction

The Internet Open Trading Protocol (IOTP) provides a framework for Internet commerce. IOTP is independent of payment system but can encapsulate and support payment systems such as SET, Mondex, CyberCoin, GeldKarte, DigiCash, etc. IOTP provides an electronic capability that replicates the usual methods of trading, buying, selling, and barter that have existed for many hundreds of years. Two unfamiliar parties who buy and sell using electronic commerce that conform to the IOTP specifications can complete the business safely and successfully.

IOTP supports:

- Familiar trading models
- New trading models
- Global interoperability

IOTP focuses on how consumer to business electronic commerce applications interoperate and communicate. The protocol describes the content, format, and sequences of messages that pass among the participants in an electronic trade.

IOTP Transactions, Trading Roles, and Trading Exchanges

Table 1-1 summarizes the IOTP defined transactions, trading roles, and trading exchanges. The following sections describe these in more detail.

IOTP Transactions

IOTP transaction types defined by the protocol include:

- **Purchase.** This supports a purchase involving an offer, a payment, and, optionally, a delivery.

TABLE 1-1

The IOTP Transactions, Trading Roles, and Trading Exchanges

IOTP Transactions	IOTP Trading Roles	IOTP Trading Exchanges
Purchase	Consumer	Offer
Refund	Merchant	Payment
Value Exchange	Payment Handler	Delivery
Authentication	Delivery Handler	Authentication
Withdrawal	Merchant Customer Care Provider	
Deposit		
Inquiry		
Ping		

- **Refund.** This supports the refund of a payment, usually as a result of an earlier purchase.
- **Value Exchange.** This involves two payments that result in the exchange of value from one combination of currency and payment method to another.
- **Authentication.** This supports the authentication of one party to make sure that another party is who it appears to be.
- **Withdrawal.** This supports the withdrawal of electronic cash from a financial institution.
- **Deposit.** This supports the deposit of electronic cash at a financial institution.
- **Inquiry.** This supports inquiries on the status of an IOTP transaction that is either in progress or is complete.
- **Ping.** This supports a simple query that enables one IOTP-aware application to determine whether another IOTP application running elsewhere is working.

Each IOTP Transactions involves:

- One or more organizations playing a **Trading Role.**
- A set of **Trading Exchanges** that involve the exchange of data, between Trading Roles, in the form of a set of **Trading Components.**

Trading Roles

The Trading Roles identify the different parts or roles that organizations can assume during a trade transaction. Figure 1-1 shows the five IOTP Trading Roles. The roles are:

- **Consumer.** The person or organization that is to receive and pay for the goods or services.
- **Merchant.** The person or organization from whom the purchase is being made. The merchant is legally responsible for providing the goods or services and receives the benefit of the payment.
- **Payment Handler.** The entity that physically receives the payment from the Consumer on behalf of the Merchant.
- **Delivery Handler.** The entity that physically delivers the goods or services to the Consumer on behalf of the Merchant.

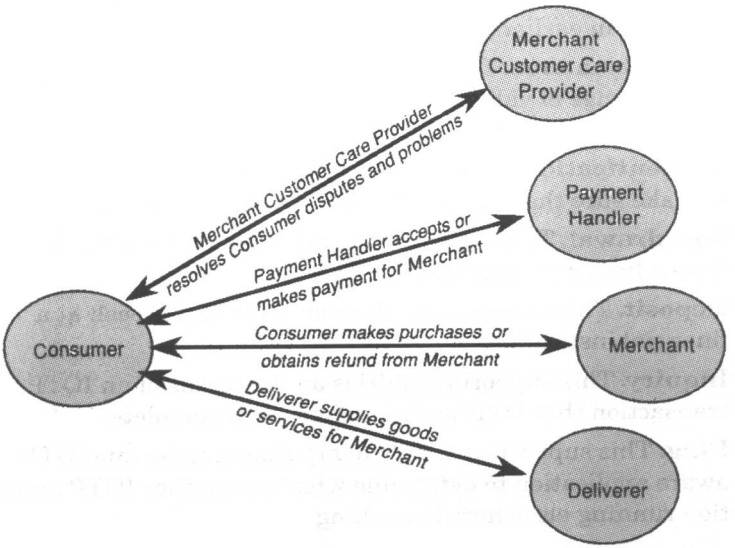

Figure 1-1
IOTP Trading Roles

- **Merchant Customer Care Provider.** The entity that is involved with customer dispute negotiation and resolution on behalf of the Merchant.

In the IOTP specification the words Consumer, Merchant, Payment Handler, Delivery Handler or Customer Care Provider refer to the Trading Role rather than an actual organization.

The different roles can be carried out by one or more organizations. In the simplest case one organization, a merchant, for example, could handle the purchase, accept the payment, deliver the goods, and provide merchant customer care. Here the merchant is assuming multiple roles and can even function as a consumer when buying goods or services.

At the other extreme, a merchant might handle the purchase but instruct the consumer to pay a bank or financial institution, request that delivery be made by an overnight courier firm, and instruct the consumer to contact an organization that provides service if problems arise. Here the merchant is assuming a limited role and delegating other roles.

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