

Charge It!



HOW TO PROCESS ONLINE CREDIT CARD TRANSACTIONS

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Point, click, buy. Pack, ship, get the money. You want to get in on the e-commerce action and create a virtual cash register? Then you need to be able to process credit card transactions, whether you're selling one item or a warehouse of goods. There is a wide variety of card processing models, credit card options, payment processing software solutions, banking relationships, and online business models. We'll explain how online credit card transactions are processed and what solutions are available to Web builders interested in creating an e-store.

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Credit Card Transaction Workflow

Banks think of Internet credit card orders as the same type of transactions as mail orders or telephone orders (MOTO). In MOTO transactions, the credit card is not present. There is no way for you, the merchant, to verify the legitimacy of your customer's card or identity before confirming the order.

The simplicity of accepting credit card payments over the phone, through the mail, or via encrypted Internet protocols is a true convenience to both you and your customer. The catch is that in all MOTO-type transactions the merchant carries all the risk for fraudulent credit card use. Merchant beware: You'll need to develop policies and procedures to protect yourself from fraud.

Receiving a legitimate credit card number from a customer is only the beginning of a complex process involving more than just you and your customer. From the time that your customer clicks the Pay Now button to the time that your bank balance increases, the transaction can pass through as many as six to eight different groups.

In addition to you and your customer, the people and organizations involved in a credit card transaction include:

- **The merchant bank:** the bank where your account is located
- **The acquiring bank:** a bank that specializes in managing credit card transactions for merchants; sometimes referred to as a "processor"
- **The credit card network:** the communications network that connects issuing and acquiring banks; built by MasterCard and Visa, it is extended to the Internet by companies such as [CyberCash](#) and [VeriFone](#) (now part of Hewlett-Packard)
- **The issuing bank:** the company that issues the credit card to the customer

The basic payment transaction process works like this:

1. Your customer sends his or her credit card number, name, billing address, and other details of the transaction to you through the Internet.
2. You forward the transaction details and card number to the acquiring bank.
3. The acquiring bank sends the transaction data through the MasterCard or Visa network to the issuing bank.
4. The issuing bank performs a variety of security checks, including available funds, address verification, and card number validation.
5. The issuing bank tells the credit card network whether or not the transaction is approved, and in turn, the credit card network notifies the acquiring bank and you.
6. You send a request to the acquiring bank to capture the funds.
7. The acquiring bank forwards the request through the credit card network to the issuing bank.
8. Transactions are settled nightly when the issuing bank pays the acquiring bank and the acquiring bank transfers the funds into your merchant bank account (less the bank's fees for servicing the transaction).
9. The credit card statement shows up in the customer's mailbox with line-item details of the transaction, including the name of your company as you set it up with the acquiring bank. The customer pays the issuing bank the balance due at a later time.

Still with us? Of course each step has specific technical requirements. But before you begin, you have to

decide how much work you want to do yourself and how much you'd like to let other services handle for you.

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Outsourcing Transaction Solutions

Outsourcing is a great solution for many merchants, large or small. Depending upon the degree of control you desire, you may want to let someone else handle the technical complexities of accepting credit cards online.

One thing to consider when reviewing any outsourced option is what company name you want to appear on your customer's credit card statement. If you use a third party's merchant ID, then its name will show up on the statement. If you want your name to appear on the bill, then you'll need to obtain your own merchant ID and be sure the outsourced service you choose can accommodate you.

Buy Buttons

On the simple end of the spectrum, a number of service providers, such as [Beseen.com](#) or [Authorize.net](#), offer Buy buttons. These companies enable you to embed Buy buttons in your HTML code next to individual products or services. When your customer clicks the button, he or she is presented with an order form for that single item. The company offering the Buy button service hosts this order form. The service holds your customer's credit card information until you ship out the order. Then the hosting company processes the transaction under its name and sends you a check, minus processing fees.

Shopping Carts With Integrated Payment Processing

If you need to sell more than one item at a time, you'll have to provide your customers with a shopping cart. Services such as [Yahoo Store Listings](#) or [iCat's Commerce Cart](#) let you complete a few registration forms (including your [merchant ID and terminal ID](#)), and before you know it, you're set up with an e-commerce solution that can stand alone or become attached to a larger Web site. Bank of America recently announced a new service called [Bank of America eStores](#) that enables small merchants to build and manage online stores. Wells Fargo Bank also launched its own [One-Stop eStore](#) service. These services are tightly integrated with the payment processing capabilities of each bank.

Fully Integrated Order Management Solutions

Many fulfillment companies--companies that warehouse products and ship orders for you--offer the ability to process credit cards. These companies can also handle returns, credits, and partial shipments, and provide a slew of other order management services. Sometimes you can use the fulfillment company's merchant ID for your transactions, which will save you the step of applying for a merchant account. The fulfillment company will simply cut you a check for funds it has received on your behalf.

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Build Your Own Transaction Solutions

If you decide to set up your own transaction processing mechanisms, you will need to get some software that can help your Web server and e-commerce application send and receive data from the credit card network.

Software of this type comes from vendors such as [CyberCash](#), [CyberSource](#), [ICVerify](#), and [Verifone](#). Some of these software solutions come with ready-made interfaces designed to plug into boxed e-commerce applications such as [Intershop](#). Other payment software solutions have ready-made interfaces for use with application servers such as [ColdFusion](#). If you want to write code from scratch, each of these solutions has application programming interfaces (APIs) that make them accessible to a variety of programming languages.

Address Verification Service (AVS)

Some software and services also offer address verification service (AVS). AVS is used to validate the billing or shipping address that a customer gives you against the billing address and zip code that the issuing bank has on record for the customer's card. When AVS checks an address, it returns a rating indicating how closely the two addresses match. This works well for a customer who entered his or her address for an order as "123 Main St., San Francisco, CA 94107," but has "123 Main Street, San Francisco, CA 94107-2235" on file with the issuing bank. In this case, AVS would tell you that there is a close but not exact match. With this information, you can decide how closely an address must match before you will allow an order to be placed.

Secure Connection (SSL)

When accepting credit cards online and subsequently passing the data on to the credit card networks, you must encrypt the data that is transferred between you and your customer. To accomplish this end, you need to be running SSL (Secure Sockets Layer). If your Web server is not already configured to run SSL, you'll have to obtain a certificate from [Verisign](#) and install the certificate on your Web server. Sometimes your hosting service can do this for you or will let you use its SSL certificate. Once SSL is set up, use URLs beginning with [https://](#) to ensure that a secure connection is in place.

Installation

Once your software is installed and you have completed the initial registration, configure the software or service with your merchant ID and terminal ID (MID/TID) pair and manually run a few test transactions to work out any kinks. Your bank can provide dummy credit card numbers for testing purposes.

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Obtain a Merchant ID and Terminal ID

In order to communicate with the credit card networks and process payments under your name, you'll need to obtain your own MID (merchant ID) and TID (terminal ID).

The MID and TID are unique identifying numbers that indicate who you are and where the transaction originates. To get your MID/TID pair, you'll need to apply with a merchant bank for an account enabled to receive credit card payments. You may or may not be able to get this service from your current bank. Start by telling your bank that you want to accept credit cards over the Internet. Your bank should have direct relationships with one or more acquiring banks that can handle both credit card and Internet transactions. If not, you'll need to go to another bank to establish your MID/TID pair.

Once a merchant bank accepts your application, it will give you the MID/TID pair. These numbers are the key identifiers you'll use to configure your Internet-based payment software or that you'll provide to your outsourced service so that it can correctly route payments for you.

Furthermore, when you pick a merchant bank, you'll inherit a relationship with an acquiring bank. Be aware that different acquiring banks use different payment processing models. You need to know whether your acquiring bank can process your transaction immediately, the same day, or later than the day the order was placed; that is, if you promise to ship your product on the same day the order is received, then you need to know that the processing back end can support it. Work with your bank to assure that the relationships they have with acquiring banks will also fit your needs.

A number of independent agents sell credit card processing services on behalf of larger companies such as Visa and MasterCard. The credit card companies do not employ these salespeople, and new sign-ups are these agents' only source of income. Because independent agents only make money when they sign you up, some of the less professional ones may make outrageous and unrealistic claims to tempt you. You've probably received annoying spam like this: "Fast! Cheap! Easy! Take credit card orders in seconds flat! Sign up with this processing service now!"

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Checkout Procedures

Now comes the fun part: putting the pieces together. The number of pages you build yourself depends on how much control you've retained with your software and services decisions. Here we've outlined the basic procedures contained within the checkout and payment pages of an e-commerce-enabled Web site.

Shopping Cart

Here the customer sees which items he or she has selected before checking out of the store. This page lists each item in the cart, the number of items in the cart, a description or model number of each item, the price per item, and the subtotal of the order before applicable taxes and shipping charges.

At this point, you should begin using the SSL protocol to protect your customer's personal information during transmission. To use the secure protocol, be sure that any links to the next step in the checkout process begin with [https://](#).

Address and Shipping

This page captures the shipping address for the order and the billing address associated with the credit card that will be used at the time of checkout. Usually this page also allows the customer to choose a shipping service.

As this page is served, set the content expiration date of the page to expire soon after this page is served. This will prevent other people who may share your customer's computer from using the Back button to obtain personal information or credit card numbers. You can set the expiration of the page using HTTP headers or HTML meta tags:

```
<META HTTP-EQUIV="Expires" CONTENT="Sun., 1 Jan. 2000 00:00:01 GMT">
```

When this page is submitted, it will provide enough information for your script to calculate shipping charges, look up the applicable tax rates, and calculate total tax based upon the order details and the ship-to address. You'll want all of these calculations to display in the next step.

Review Order and Enter Credit Card Information

Before this page renders, your script should verify that all the required fields from the prior page were filled out. If so, proceed with the process. Otherwise, the customer should get a prompt to fill out the necessary information completely.

The Review Order and Enter Credit Card Information page displays the order in total, plus a few fields for capturing the credit card number, expiration date, name on the card, and any additional information you may want from the customer to help prevent fraud. This additional data may include the zip code of the credit card billing address, the four nonembossed numbers on the face of the credit card being used, or the phone number used in association with the billing address. None of the other order details are editable at this point. This is the customer's last chance to look over the order and see that everything is correct before submitting his or her order and credit card information to you by clicking the Place Order Now button.

Again, as this page is served, set the expiration of the page to prevent the Back button from revealing any private information about the customer.

With the data from this form, plus the information from prior parts of the checkout stream, the script can now

begin processing the payment. At the same time, it should send a message to inform the customer that processing the payment may take a minute or two. Ask the customer to be patient and not to press the Reload or Back buttons on his or her browser.

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Confirmation and Payment

Before the order confirmation page is rendered, your script should perform a series of validation checks. Make sure there are no typos in the date. Check that 16 numbers were entered for the credit card, unless it begins with a 3, in which case it is a 15-digit American Express Card number. You can even use a [JavaScript algorithm](#) to see if the card number submitted is a possible card number.

All the required fields from the prior page must be filled out. If so, proceed with the process. Otherwise, the script should prompt the customer to fill out the necessary information completely or correct any mistakes. If everything looks good, it can pass the required transaction information on to the payment processing software that you installed on your Web server. To do this, use the APIs, custom tags, or sample code that the software vendor provided.

Examples of values passed to the payment software include: MID/TID, credit card number, expiration date, name on card, order number, address (if you plan to use AVS as part of fraud prevention), and the action or transaction type. Transaction types are returns (transfer funds from you to the customer), voids (to cancel a transaction before capture), or settlements (capture funds that were previously authorized).

Please note that each software package and service provider solution is slightly different. You'll need to refer to the documentation provided from each vendor for the exact specifications. Once the transaction information is passed off for processing, the script should wait for a response to see if the transaction was approved or denied. If you are also using AVS, then you'll receive an address-match rating.

One scheme of AVS ratings is:

- A - address matches, zip does not
- E - ineligible transaction
- N - neither address or zip matches
- R - retry; there was a communication error
- S - card type not supported
- U - address information unavailable
- W - nine-digit zip matches, address does not
- X - exact match (nine-digit zip and address)

Use the rating values returned by AVS to set your own tolerance levels for accuracy in the address information. For example, A or X would allow the transaction, while W, U, or S would alert you to make a customer service call first. E or N would disallow the order, prompt a request for another card, and include the customer service number for your business. Any other rating would cause an appropriate error message to appear.

A strict policy will allow less fraud, but could also turn away valid orders. You'll need to determine your own acceptable balance between order volume and fraud risk. You may also want to validate the order using additional services for merchant-level fraud detection, such as [HNC](#) or [FairIsaac](#).

Next, if there are any failure or error messages, let the customer know what he or she will need to do to get the transaction to process successfully. If the transaction was successful, then you also will have received the following back from the payment software:

- **Authentication code:** a number you'll use when capturing funds at a later date
- **Transaction ID:** a unique identifier for the transaction
- **Date and time stamp:** the time the transaction was accepted

Save these codes with the order. You'll want to be able to cross-reference them if customer service issues come up.

Finally, have the script return a thank-you message to your customer, including the order number, order totals, shipping information, and other details. Some merchants will add in the last four digits of the card as a convenience to their customers. It is also good customer service to email a duplicate of this confirmation and thank-you to your customer, including instructions for tracking the order or contacting customer service.

Getting Paid

If your product or service is delivered or shipped on the same day as the transaction, or is immediately billable, then the transaction above will be complete and funds will be transferred to your account overnight.

If you deliver the customer's order at a later date, then you need to complete an additional step--capturing the funds--after the order has been shipped to the customer.

Once an order has been shipped or delivered, you can request the transfer of funds to your account. Vendors such as [CyberCash](#), [CyberSource](#), and [VeriFone](#) provide software to handle this second step. For smaller-volume merchants, CyberCash and CyberSource provide Web-based interfaces that allow you to check off which orders have been shipped. The Web-based software handles the rest, and funds are delivered to your bank account.

If you anticipate a large number of transactions, you may want to use the APIs provided by the payment software vendors to automate the process. Or you may want only to validate and authorize transactions online and then to use your existing ERP, order entry, or financial systems software to settle and capture transactions, assuming that those systems are already set up to communicate with the acquiring bank and credit card network.