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Instant Payment Notification

[Introduction](#)[Technical Overview](#)[Manual](#)[Code Samples](#)[Techniques](#)[Testing](#)[Developer Support](#)

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Technical Overview

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Instant Payment Notification allows you to integrate your PayPal payments with your website's back-end operations, so you get immediate notification and authentication of the PayPal payments you receive. [Start using IPN.](#)

How It Works

When a customer makes a payment to you, PayPal will post a notification to your server at a URL you specify. Included in this notification will be all of your customer's payment information (e.g. customer name, amount) as well as a piece of encrypted code. When your server receives a notification, it will then post the information, including the encrypted code, back to a secure PayPal URL. PayPal will authenticate the transaction by checking the encrypted string. This post-back of the IPN data to PayPal prevents "spoofing," so you can be sure that the IPN came from PayPal. Upon verification, PayPal will send confirmation of its validity back to your server.

Note: To activate Instant Payment Notification, you will need to enter the URL at which you would like to receive the notification posts from your Profile.

After you have activated Instant Payment Notification, your server will be sent a notification every time you receive a payment, this notification will be sent as a hidden "FORM POST" to the URL you specified, and will include all of the payment information. The FORM variables for the notification are listed at the bottom of this page.

Each time you receive an IPN from PayPal, you must complete the Notification Validation process described below before fulfilling the order. Verifying the information listed will ensure that the transaction is legitimate.

Notification Validation

To ensure that a payment has been made into your PayPal account, you **must** verify that the email address used as your "receiver_email" has been registered and confirmed in your PayPal account.

Once your server has received the Instant Payment Notification, you will need to confirm it by constructing an HTTP POST to PayPal. Your POST should be sent to **https://www.paypal.com/cgi-bin/webscr**

You must post **all** of the form variables you received **exactly** as you received them. You will also need to append a variable named "cmd" with the value "_notify-validate" (e.g. cmd=_notify-validate) to the POST string.

PayPal will respond to the post with a single word, "VERIFIED" or "INVALID", in the body of the response. When you receive a VERIFIED response, you need to perform several checks before fulfilling the order:

- Confirm that the "payment_status" is "Completed," since IPNs are also sent for other results such as "Pending" or "Failed"
- Check that the "txn_id" is not a duplicate to prevent a fraudster from using reusing an old, completed transaction
- Validate that the "receiver_email" is an email address registered in your PayPal account, to prevent the payment from being sent to a fraudster's account
- Check other transaction details such as the item number and price to confirm that the price has not been changed

Once you have completed the above checks, you may update your database with the IPN data and process the purchase.

If you receive an "INVALID" notification, it should be treated as suspicious and be investigated.

IPN Variables

Variable	Value	Description
Basic Information		
business	Transaction-specific	Email address or account ID of the payment recipient (i.e., the merchant). Essentially an echo of the "business" variable passed in the website payment button HTML code.
receiver_email	Transaction-specific	Primary email address of the payment recipient (i.e., the merchant). If the payment is sent to a non-primary email address on your PayPal account, the receiver_email will still be your primary email.
receiver_id	Transaction-specific	Unique account ID of the payment recipient (ie., the merchant). This is the same as the receipt's referral ID.
item_name	Transaction-specific	Item name as passed by

		you, the merchant. Or, if not passed by you, as entered by your customer. If this is a shopping cart transaction we will append the number of the item (e.g. item_name1, item_name2).
item_number	Transaction-specific	Item number as passed by you, the merchant. If this is a shopping cart transaction we will append the number of the item (e.g. item_number1, item_number2).
quantity	Transaction-specific	Quantity as entered by your customer or as passed by you, the merchant. If this is a shopping cart transaction we will append the number of the item (e.g. quantity1, quantity 2).
Advanced and Custom Information		
invoice	Transaction-specific	Invoice number as passed by you, the merchant. Your customer is not able to view or edit this. It must be unique per transaction.
custom	Transaction-specific	Custom value as passed by you, the merchant. This is a pass-through variable that is never presented to your customer.
memo	Transaction-specific	Memo as entered by your customer in PayPal Website Payments note field.
tax	Transaction-specific	Amount of tax charged on payment. If this is a shopping cart transaction, refer to the Shopping Cart Information section for more information.
option_name1	Transaction-specific	Option 1 Name as requested by you. If this is a shopping cart transaction, refer to the Shopping Cart Information section for more information.
option_selection1_x	Transaction-specific	Option 1 Choice as entered by your customer. If this is a shopping cart transaction, refer to the Shopping Cart Information section for more information.

option_name2	Transaction-specific	Option 2 Name as requested by you. If this is a shopping cart transaction, refer to the Shopping Cart Information section for more information.
option_selection2_x	Transaction-specific	Option 2 Choice as entered by your customer. If this is a shopping cart transaction, refer to Shopping Cart Information section for more information.
Shopping Cart Information		
num_cart_items	PayPal Shopping Cart Transaction-specific	If this is a shopping cart transaction, number of items in cart.
tax	Transaction-specific	PayPal will append the number of the item (e.g., item_name1, item_name2), where the tax# is only included if there was a specific tax amount applied to a particular shopping cart item. Because profile tax may apply to other items in the cart, the sum of tax# may not total to tax.
option_name1	Transaction-specific	PayPal will append the number of the item (e.g., option_name1, option_name2), where the # represents the number of the shopping cart detail item.
option_selection1_x	Transaction-specific	PayPal will append the number of the item (e.g., option_selection1_x, option_selection2_x), where the # represents the number of the shopping cart detail item.
option_name2	Transaction-specific	PayPal will append the number of the item (e.g., option_name1, option_name2), where the # represents the number of the shopping cart detail item.
option_selection2_x	Transaction-specific	PayPal will append the number of the item(e.g., option_selection1_x, option_selection2_x), where the # represents the number of the shopping cart detail item.
mc_gross_x	Transaction-specific	The amount is in the

	for Multiple Currencies	currency of mc_currency, where # is the shopping cart detail item number. The sum of mc_gross# should total mc_gross.
mc_handling#	Transaction-specific	The # is the shopping cart detail item number. The "handling_cart" cart-wide Web Accept variable is also included in the mc_handling variable; for this reason, the sum of mc_handling# may not be equal to mc_handling.
mc_shipping#	Transaction-specific	This is the combined total of the shipping and shipping2 Web Accept variables, where # is the shopping cart detail item number. Shipping# is only shown when the merchant applies a shipping amount for a specific item. Because profile shipping may apply, the sum of shipping# may not be equal to shipping.
Transaction Information		
payment_status	"Canceled_Reversal"	This means a reversal has been canceled (e.g. you, the merchant, won a dispute with the customer and the funds for the transaction that was reversed have been returned to you).
	"Completed"	The payment has been completed and the funds have been added successfully to your account balance.
	"Denied"	You, the merchant, denied the payment. This will only happen if the payment was previously pending due to one of the "pending reasons" below.
	"Failed"	The payment has failed. This will only happen if the payment was made from your customer's bank account.
	"Pending"	The payment is pending - see the "pending reason" variable below for more information. Note: You will receive another instant payment notification when the payment becomes "completed", "failed", or "denied".
	"Refunded"	You, the merchant,

		refunded the payment.
	"Reversed"	This means that a payment was reversed due to a chargeback or other type of reversal. The funds have been removed from your account balance and returned to the buyer. The reason for the reversal is given by the reason_code variable.
pending_reason	This variable is only set if payment_status="Pending"	
	"address"	The payment is pending because your customer did not include a confirmed shipping address and you, the merchant, have your Payment Receiving Preferences set such that you want to manually accept or deny each of these payments. To change your preference, go to the Preferences section of your Profile.
	"echeck"	The payment is pending because it was made by an eCheck, which has not yet cleared.
	"intl"	The payment is pending because you, the merchant, hold a non-U.S. account and do not have a withdrawal mechanism. You must manually accept or deny this payment from your Account Overview.
	"multi_currency"	You do not have a balance in the currency sent, and you do not have your Payment Receiving Preferences set to automatically convert and accept this payment. You must manually accept or deny this payment.
	"unilateral"	The payment is pending because it was made to an email address that is not yet registered or confirmed.
	"upgrade"	The payment is pending because it was made via credit card and you, the merchant, must upgrade your account to Business or Premier status in order to receive the funds. It may also mean that you have reached the monthly limit for transactions on your

		account.
	"other"	The payment is pending for a reason other than those listed above. For more information, contact customer service.
reason_code	This variable is only set if payment_status="Reversed"	
	"buyer_complaint"	A reversal has occurred on this transaction due to a complaint about the transaction from your customer.
	"chargeback"	A reversal has occurred on this transaction due to a chargeback by your customer.
	"guarantee"	A reversal has occurred on this transaction due to your customer triggering a money-back guarantee.
	"refund"	A reversal has occurred on this transaction because you have given the customer a refund.
	"other"	A reversal has occurred on this transaction due to a reason not listed above.
payment_date	Transaction-specific	Time/Date stamp generated by PayPal system [format: "18:30:30 Jan 1, 2000 PST"].
txn_id	Transaction-specific	A unique transaction ID generated by the PayPal system.
parent_txn_id	Transaction-specific	In the case of a refund, reversal, or canceled reversal, this variable contains the txn_id of the original transaction, while txn_id contains a new ID for the new transaction.
txn_type	"cart"	This payment was sent by your customer via the PayPal Shopping Cart feature.
	"send_money"	This payment was sent by your customer from the PayPal website, using the "Send Money" tab.
	"web_accept"	The payment was sent by your customer via Buy Now Buttons, Donations, or Auction Smart Logos.
payment_type	"echeck"	This payment was funded with an eCheck.

	"instant"	This payment was funded with PayPal balance, credit card, or Instant Transfer.
Currency and Exchange Information		
mc_gross	Transaction-specific for Multiple Currencies	Full amount of the customer's payment, before transaction fee is subtracted. Equivalent to "payment_gross" for USD payments. If this amount is negative, it signifies a refund or reversal, and either of those payment statuses can be for the full or partial amount of the original transaction.
mc_fee	Transaction-specific for Multiple Currencies	Transaction fee associated with the payment. "mc_gross" minus "mc_fee" will equal the amount deposited into the "receiver_email" account. Equivalent to "payment_fee" for USD payments. If this amount is negative, it signifies a refund or reversal, and either of those payment statuses can be for the full or partial amount of the original transaction fee.
mc_currency	For payment IPNs, this is the currency of the payment. For non-payment subscription IPNs, this is the currency of the subscription.	
	"USD"	The currency of the payment is U.S. Dollars.
	"CAD"	The currency of the payment is Canadian Dollars.
	"GBP"	The currency of the payment is Pounds Sterling.
	"EUR"	The currency of the payment is Euros.
	"JPY"	The currency of the payment is Yen.
mc_handling#	Transaction-specific	<p>This is the total handling amount associated with the transaction.</p> <p>If this is a shopping cart transaction, refer to the Shopping Cart Information for more information.</p>
mc_shipping#	Transaction-specific	<p>This is the total shipping amount associated with the transaction.</p> <p>If this is a shopping cart transaction, refer to the</p>

		Shopping Cart Information for more information.
settle_amount	Transaction-specific	Amount that is deposited into the account's primary balance after a currency conversion from automatic conversion through your Payment Receiving Preferences or manual conversion through manually accepting a payment.
settle_currency	Transaction-specific	Currency of settle_amount.
exchange_rate	Transaction-specific for Multiple Currencies	Exchange rate used if a currency conversion occurred.
payment_gross	Transaction-specific for USD payments only	Full USD amount of the customer's payment, before transaction fee is subtracted. Will be empty for non-USD payments. This is a legacy field replaced by "mc_gross". If this amount is negative, it signifies a refund or reversal, and either of those payment statuses can be for the full or partial amount of the original transaction.
payment_fee	Transaction-specific for USD payments only	USD transaction fee associated with the payment. "payment_gross" minus "payment_fee" will equal the amount deposited into the "receiver_email" account. Will be empty for non-USD payments. This is a legacy field replaced by "mc_fee". If this amount is negative, it signifies a refund or reversal, and either of those payment statuses can be for the full or partial amount of the original transaction fee.
Auction Information		
for_auction	"true"	This is an auction payment. (Payments made using Pay for eBay Items or Smart Logos, as well as Send Money/Money Request payments with the type "Goods-Auction")
auction_buyer_id	Transaction-specific for Auctions	This is set to the auction buyer's ID.
auction_closing_date	Transaction-specific for Auctions	This is set to the closing date of the auction.
auction_multi_item	Transaction-specific	This is a counter used for

	for Auctions	multi-item auction payments. It allows you to customize your script to only count the mc_gross or payment_gross for the first IPN you receive from a multi-item auction (auction_multi_item=1), since each item from the auction will generate an Instant Payment Notification showing the amount for the entire auction.
Buyer Information		
first_name	Transaction-specific	Customer's first name.
last_name	Transaction-specific	Customer's last name.
payer_business_name	Transaction-specific	Customer's company name.
address_street	Transaction-specific	Customer's street address.
address_city	Transaction-specific	City of customer's address.
address_state	Transaction-specific	State of customer's address.
address_zip	Transaction-specific	Zip code of customer's address.
address_country	Transaction-specific	Country of customer's address.
address_status	"confirmed"	Customer provided a Confirmed Address.
	"unconfirmed"	Customer provided an Unconfirmed Address.
payer_email	Transaction-specific	Customer's primary email address. Use this email to provide any credits.
payer_id	Transaction-specific	Unique customer ID.
payer_status	"verified"	Customer has a Verified PayPal account.
	"unverified"	Customer has an Unverified PayPal account.
IPN Information		
notify_version	"1.6"	Version of Instant Payment Notification.
Security Information		
verify_sign	Transaction-specific	An encrypted string used to validate the authenticity of the transaction (see below).
mc_gross_x	Transaction-specific for Multiple Currencies	

mc_fee_x	Transaction-specific for Multiple Currencies	
mc_currency_x	Transaction-specific for Multiple Currencies	
payment_gross_x	Transaction-specific for USD payments only	If the payment is USD, then the value for this is the same as that for the mc_gross_x, where x is the record number; if the currency is not USD, then this is an empty string.
status_x		
	"Completed"	The payment has been processed, regardless if this was originally a unilateral payment.
	"Failed"	The payment failed because there was not enough funds in the balance.
	"Reversed"	This is for unilateral payments that were not claimed after 30 days and have been returned to the Sender. Or the funds have been returned because the Receiver's account was locked.
	"Pending"	This is for unilateral payments that are unclaimed.
payment_fee_x	Transaction-specific for USD payments only	If the payment is USD, then the value for this is the same as that for the mc_fee_x, where x is the record number; if the currency is not USD, then this is an empty string.
unique_id_x	Transaction-specific	

View [additional IPN variables for Subscriptions and Recurring Payments](#).

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