java.net

Class DatagramSocket

java.lang.Object
   ▼ java.net.DatagramSocket

Direct Known Subclasses:
   MulticastSocket

public class DatagramSocket
   extends Object

This class represents a socket for sending and receiving datagram packets.

A datagram socket is the sending or receiving point for a packet delivery service. Each packet sent or received on a datagram socket is individually addressed and routed. Multiple packets sent from one machine to another may be routed differently, and may arrive in any order.

UDP broadcasts sends are always enabled on a DatagramSocket. In order to receive broadcast packets a DatagramSocket should be bound to the wildcard address. In some implementations, broadcast packets may also be received when a DatagramSocket is bound to a more specific address.

Example: DatagramSocket s = new DatagramSocket(null); s.bind(new InetSocketAddress(8888)); Which is equivalent to: DatagramSocket s = new DatagramSocket(8888); Both cases will create a DatagramSocket able to receive broadcasts on UDP port 8888.

Since:    JDK1.0
See Also: DatagramPacket, DatagramChannel

Constructor Summary

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Methods inherited from class java.lang.Object
- `clone`, `equals`, `finalize`, `getClass`, `hashCode`, `notify`, `notifyAll`, `toString`, `wait`, `wait`, `wait`
If there is a security manager, its `checkListen` method is first called with 0 as its argument to ensure the operation is allowed. This could result in a SecurityException.

**Throws:**
- `SocketException` - if the socket could not be opened, or the socket could not bind to the specified local port.
- `SecurityException` - if a security manager exists and its `checkListen` method doesn't allow the operation.

**See Also:**
- `SecurityManager.checkListen(int)`

---

### DatagramSocket

**protected** `DatagramSocket(DatagramSocketImpl impl)`

Creates an unbound datagram socket with the specified `DatagramSocketImpl`.

**Parameters:**
- `impl` - an instance of a `DatagramSocketImpl` the subclass wishes to use on the DatagramSocket.

**Since:**
- 1.4

---

### DatagramSocket

**public** `DatagramSocket(SocketAddress bindaddr)`

Throws `SocketException`

Creates a datagram socket, bound to the specified local socket address.

If, if the address is `null`, creates an unbound socket.

If there is a security manager, its `checkListen` method is first called with the port from the socket address as its argument to ensure the operation is allowed. This could result in a SecurityException.

**Parameters:**
- `bindaddr` - local socket address to bind, or `null` for an unbound socket.

**Throws:**
- `SocketException` - if the socket could not be opened, or the socket could not bind to the specified local port.
- `SecurityException` - if a security manager exists and its `checkListen` method doesn't allow the operation.

**Since:**
- 1.4

**See Also:**
- `SecurityManager.checkListen(int)`
DatagramSocket

```java
public DatagramSocket(int port)
    throws SocketException
```

Constructs a datagram socket and binds it to the specified port on the local host machine. The socket will be bound to the wildcard address, an IP address chosen by the kernel.

If there is a security manager, its `checkListen` method is first called with the `port` argument as its argument to ensure the operation is allowed. This could result in a SecurityException.

**Parameters:**
- `port` - port to use.

**Throws:**
- `SocketException` - if the socket could not be opened, or the socket could not bind to the specified local port.
- `SecurityException` - if a security manager exists and its `checkListen` method doesn't allow the operation.

**See Also:**
- `SecurityManager.checkListen(int)`

---

DatagramSocket

```java
public DatagramSocket(int port, InetAddress laddr)
    throws SocketException
```

Creates a datagram socket, bound to the specified local address. The local port must be between 0 and 65535 inclusive. If the IP address is 0.0.0.0, the socket will be bound to the wildcard address, an IP address chosen by the kernel.

If there is a security manager, its `checkListen` method is first called with the `port` argument as its argument to ensure the operation is allowed. This could result in a SecurityException.

**Parameters:**
- `port` - local port to use
- `laddr` - local address to bind

**Throws:**
- `SocketException` - if the socket could not be opened, or the socket could not bind to the specified local port.
- `SecurityException` - if a security manager exists and its `checkListen` method doesn't allow the operation.

**Since:**
- JDK1.1

**See Also:**
- `SecurityManager.checkListen(int)`

---

**Method Detail**

**bind**
public void bind(SocketAddress addr)
        throws SocketException

Binds this DatagramSocket to a specific address & port.

If the address is null, then the system will pick up an ephemeral port and a valid local address to bind the socket.

Parameters:
    addr - The address & port to bind to.

Throws:
    SocketException - if any error happens during the bind, or if the socket is already bound.
    SecurityException - if a security manager exists and its checkListen method doesn't allow the operation.
    IllegalArgumentException - if addr is a SocketAddress subclass not supported by this socket.

Since: 1.4

connect

public void connect(InetAddress address, int port)

Connects the socket to a remote address for this socket. When a socket is connected to a remote address, packets may only be sent to or received from that address. By default a datagram socket is not connected.

If the remote destination to which the socket is connected does not exist, or is otherwise unreachable, and if an ICMP destination unreachable packet has been received for that address, then a subsequent call to send or receive may throw a PortUnreachableException. Note, there is no guarantee that the exception will be thrown.

A caller's permission to send and receive datagrams to a given host and port are checked at connect time. When a socket is connected, receive and send will not perform any security checks on incoming and outgoing packets, other than matching the packet’s and the socket’s address and port. On a send operation, if the packet's address is set and the packet's address and the socket's address do not match, an IllegalArgumentException will be thrown. A socket connected to a multicast address may only be used to send packets.

Parameters:
    address - the remote address for the socket
    port - the remote port for the socket.

Throws:
    IllegalArgumentException - if the address is null, or the port is out of range.
    SecurityException - if the caller is not allowed to send datagrams to and receive datagrams from the address and port.

See Also:
    disconnect(), send(java.net.DatagramPacket), receive(java.net.DatagramPacket)
connect

public void connect(SocketAddress addr) throws SocketException

Connects this socket to a remote socket address (IP address + port number).

Parameters:
   addr - The remote address.

Throws:
   SocketException - if the connect fails
   IllegalArgumentException - if addr is null or addr is a SocketAddress subclass not supported by this socket

Since: 1.4
See Also:
   connect(java.net.InetAddress, int)

disconnect

public void disconnect()

Disconnects the socket. This does nothing if the socket is not connected.

See Also:
   connect(java.net.InetAddress, int)

isBound

public boolean isBound()

Returns the binding state of the socket.

Returns:
   true if the socket successfully bound to an address

Since: 1.4

isConnected

public boolean isConnected()

Returns the connection state of the socket.

Returns:
   true if the socket successfully connected to a server
Since: 1.4

**getInetAddress**

```java
public InetAddress getInetAddress()
```

Returns the address to which this socket is connected. Returns null if the socket is not connected.

**Returns:**
the address to which this socket is connected.

**getPort**

```java
public int getPort()
```

Returns the port for this socket. Returns -1 if the socket is not connected.

**Returns:**
the port to which this socket is connected.

**getRemoteSocketAddress**

```java
public SocketAddress getRemoteSocketAddress()
```

Returns the address of the endpoint this socket is connected to, or null if it is unconnected.

**Returns:**
 a SocketAddress representing the remote endpoint of this socket, or null if it is not connected yet.

**Since:** 1.4

**See Also:**
getInetAddress(), getPort(), connect(SocketAddress)

**getLocalSocketAddress**

```java
public SocketAddress getLocalSocketAddress()
```

Returns the address of the endpoint this socket is bound to, or null if it is not bound yet.

**Returns:**
 a SocketAddress representing the local endpoint of this socket, or null if it is not bound yet.

**Since:**

file://C:\Program Files\Java\jdk1.5.0_04\docs\api\java\net\DatagramSocket.html 10.10.2005
1.4

See Also:
getLocalAddress(), getLocalPort(), bind(SocketAddress)

send

public void send(DatagramPacket p)
throws IOException

Sends a datagram packet from this socket. The DatagramPacket includes information indicating the data to be sent, its length, the IP address of the remote host, and the port number on the remote host.

If there is a security manager, and the socket is not currently connected to a remote address, this method first performs some security checks. First, if p.getAddress().isMulticastAddress() is true, this method calls the security manager's checkMulticast method with p.getAddress() as its argument. If the evaluation of that expression is false, this method instead calls the security manager's checkConnect method with arguments p.getAddress().getHostAddress() and p.getPort(). Each call to a security manager method could result in a SecurityException if the operation is not allowed.

Parameters:
p - the DatagramPacket to be sent.

Throws:
IOException - if an I/O error occurs.
SecurityException - if a security manager exists and its checkMulticast or checkConnect method doesn't allow the send.
PortUnreachableException - may be thrown if the socket is connected to a currently unreachable destination. Note, there is no guarantee that the exception will be thrown.
IllegalBlockingModeException - if this socket has an associated channel, and the channel is in non-blocking mode.

See Also:
DatagramPacket, SecurityManager.checkMulticast(InetAddress), SecurityManager.checkConnect(java.lang.String, int)

receive

public void receive(DatagramPacket p)
throws IOException

Receives a datagram packet from this socket. When this method returns, the DatagramPacket's buffer is filled with the data received. The datagram packet also contains the sender's IP address, and the port number on the sender's machine.

This method blocks until a datagram is received. The length field of the datagram packet object contains the length of the received message. If the message is longer than the packet's length, the message is truncated.

If there is a security manager, a packet cannot be received if the security manager's checkAccept method does not allow it.
Parameters:
- the DatagramPacket into which to place the incoming data.

Throws:
- IOException - if an I/O error occurs.
- SocketTimeoutException - if setSoTimeout was previously called and the timeout has expired.
- PortUnreachableException - may be thrown if the socket is connected to a currently unreachable destination. Note, there is no guarantee that the exception will be thrown.
- IllegalBlockingModeException - if this socket has an associated channel, and the channel is in non-blocking mode.

See Also:
DatagramPacket, DatagramSocket

getLocalAddress

public InetAddress getLocalAddress()

Gets the local address to which the socket is bound.

If there is a security manager, its checkConnect method is first called with the host address and -1 as its arguments to see if the operation is allowed.

Returns:
the local address to which the socket is bound, or an InetAddress representing any local address if either the socket is not bound, or the security manager checkConnect method does not allow the operation.

Since:
1.1

See Also:
SecurityManager.checkConnect(java.lang.String, int)

getLocalPort

public int getLocalPort()

Returns the port number on the local host to which this socket is bound.

Returns:
the port number on the local host to which this socket is bound.

setSoTimeout

public void setSoTimeout(int timeout)

throws SocketException

Enable/disable SO_TIMEOUT with the specified timeout, in milliseconds. With this option set to a non-zero timeout, a call to receive() for this DatagramSocket will block for only this amount of time. If the timeout expires, a java.net.SocketTimeoutException is raised, though
the DatagramSocket is still valid. The option must be enabled prior to entering the blocking operation to have effect. The timeout must be > 0. A timeout of zero is interpreted as an infinite timeout.

Parameters:

- **timeout** - the specified timeout in milliseconds.

Throws:

- [SocketException](http://docs.oracle.com/javase/6/docs/api/socket/SocketException.html) - if there is an error in the underlying protocol, such as an UDP error.

Since:

- JDK1.1

See Also:

- [getSoTimeout()](http://docs.oracle.com/javase/6/docs/api/socket/DatagramSocket.html#getSoTimeout())

---

**getSoTimeout**

```java
public int getSoTimeout() throws SocketException
```

Retrive setting for SO_TIMEOUT. 0 returns implies that the option is disabled (i.e., timeout of infinity).

Returns:

the setting for SO_TIMEOUT

Throws:

- [SocketException](http://docs.oracle.com/javase/6/docs/api/socket/SocketException.html) - if there is an error in the underlying protocol, such as an UDP error.

Since:

- JDK1.1

See Also:

- [setSoTimeout(int)](http://docs.oracle.com/javase/6/docs/api/socket/DatagramSocket.html#setSoTimeout(int))

---

**setSendBufferSize**

```java
public void setSendBufferSize(int size) throws SocketException
```

Sets the SO_SNDBUF option to the specified value for this DatagramSocket. The SO_SNDBUF option is used by the network implementation as a hint to size the underlying network I/O buffers. The SO_SNDBUF setting may also be used by the network implementation to determine the maximum size of the packet that can be sent on this socket.

As SO_SNDBUF is a hint, applications that want to verify what size the buffer is should call [getSendBufferSize()](http://docs.oracle.com/javase/6/docs/api/socket/DatagramSocket.html#getSendBufferSize()).

Increasing the buffer size may allow multiple outgoing packets to be queued by the network implementation when the send rate is high.

Note: If [send(DatagramPacket)](http://docs.oracle.com/javase/6/docs/api/socket/DatagramSocket.html#send(DatagramPacket)) is used to send a DatagramPacket that is larger than the setting of SO_SNDBUF then it is implementation specific if the packet is sent or discarded.

Parameters:
size - the size to which to set the send buffer size. This value must be greater than 0.

Throws:
  SocketException - if there is an error in the underlying protocol, such as an UDP error.
  IllegalArgumentException - if the value is 0 or is negative.

See Also:
  getSendBufferSize()

getSendBufferSize

public int getSendBufferSize()
  throws SocketException

Get value of the SO_SNDBUF option for this DatagramSocket, that is the buffer size used by the platform for output on this DatagramSocket.

Returns:
  the value of the SO_SNDBUF option for this DatagramSocket

Throws:
  SocketException - if there is an error in the underlying protocol, such as an UDP error.

See Also:
  setSendBufferSize(int)

setReceiveBufferSize

public void setReceiveBufferSize(int size)
  throws SocketException

Sets the SO_RCVBUF option to the specified value for this DatagramSocket. The SO_RCVBUF option is used by the the network implementation as a hint to size the underlying network I/O buffers. The SO_RCVBUF setting may also be used by the network implementation to determine the maximum size of the packet that can be received on this socket.

Because SO_RCVBUF is a hint, applications that want to verify what size the buffers were set to should call getReceiveBufferSize().

Increasing SO_RCVBUF may allow the network implementation to buffer multiple packets when packets arrive faster than are being received using receive(DatagramPacket).

Note: It is implementation specific if a packet larger than SO_RCVBUF can be received.

Parameters:
  size - the size to which to set the receive buffer size. This value must be greater than 0.

Throws:
  SocketException - if there is an error in the underlying protocol, such as an UDP error.
  IllegalArgumentException - if the value is 0 or is negative.

See Also:
  getReceiveBufferSize()
getReceiveBufferSize

```java
public int getReceiveBufferSize()
    throws SocketException
```

Get value of the SO_RCVBUF option for this DatagramSocket, that is the buffer size used by the platform for input on this DatagramSocket.

**Returns:**
the value of the SO_RCVBUF option for this DatagramSocket

**Throws:**
SocketException - if there is an error in the underlying protocol, such as an UDP error.

**See Also:**
setReceiveBufferSize(int)

setReuseAddress

```java
public void setReuseAddress(boolean on)
    throws SocketException
```

Enable/disable the SO_REUSEADDR socket option.

For UDP sockets it may be necessary to bind more than one socket to the same socket address. This is typically for the purpose of receiving multicast packets (See MulticastSocket). The SO_REUSEADDR socket option allows multiple sockets to be bound to the same socket address if the SO_REUSEADDR socket option is enabled prior to binding the socket using bind(SocketAddress).

When a DatagramSocket is created the initial setting of SO_REUSEADDR is disabled.

The behaviour when SO_REUSEADDR is enabled or disabled after a socket is bound (See isBound()) is not defined.

**Parameters:**
on - whether to enable or disable the

**Throws:**
SocketException - if an error occurs enabling or disabling the SO_REUSEADDR socket option, or the socket is closed.

Since: 1.4

**See Also:**
getReuseAddress(), bind(SocketAddress), isBound(), isClosed()

getReuseAddress

```java
public boolean getReuseAddress()
    throws SocketException
```

Tests if SO_REUSEADDR is enabled.
Returns:
a boolean indicating whether or not SO_REUSEADDR is enabled.

Throws:
SocketException - if there is an error in the underlying protocol, such as an UDP error.

Since:
1.4

See Also:
setReuseAddress(boolean)

setBroadcast

public void setBroadcast(boolean on)
   throws SocketException

Enable/disable SO_BROADCAST.

Parameters:
on - whether or not to have broadcast turned on.

Throws:
SocketException - if there is an error in the underlying protocol, such as an UDP error.

Since:
1.4

See Also:
getBroadcast()

getBroadcast

public boolean getBroadcast()
   throws SocketException

Tests if SO_BROADCAST is enabled.

Returns:
a boolean indicating whether or not SO_BROADCAST is enabled.

Throws:
SocketException - if there is an error in the underlying protocol, such as an UDP error.

Since:
1.4

See Also:
setBroadcast(boolean)

setTrafficClass

public void setTrafficClass(int tc)
   throws SocketException

Sets traffic class or type-of-service octet in the IP datagram header for datagrams sent from
this DatagramSocket. As the underlying network implementation may ignore this value
applications should consider it a hint.
The tc **must** be in the range \( 0 \leq tc \leq 255 \) or an IllegalArgumentException will be thrown.

Notes:

for Internet Protocol v4 the value consists of an octet with precedence and TOS fields as detailed in RFC 1349. The TOS field is bitset created by bitwise-or'ing values such the following :-

- IPTOS_LOW_COST (0x02)
- IPTOS_RELIABILITY (0x04)
- IPTOS_THROUGHPUT (0x08)
- IPTOS_LOW_DELAY (0x10)

The last low order bit is always ignored as this corresponds to the MBZ (must be zero) bit.

Setting bits in the precedence field may result in a SocketException indicating that the operation is not permitted.

for Internet Protocol v6 tc is the value that would be placed into the sin6_flowinfo field of the IP header.

**Parameters:**

- \( tc \) - an int value for the bitset.

**Throws:**

- SocketException - if there is an error setting the traffic class or type-of-service

**Since:**

1.4

**See Also:**

getTrafficClass()

---

**getTrafficClass**

```java
public int getTrafficClass()
    throws SocketException
```

Gets traffic class or type-of-service in the IP datagram header for packets sent from this DatagramSocket.

As the underlying network implementation may ignore the traffic class or type-of-service set using `setTrafficClass(int)` this method may return a different value than was previously set using the `setTrafficClass(int)` method on this DatagramSocket.

**Returns:**

- the traffic class or type-of-service already set

**Throws:**

- SocketException - if there is an error obtaining the traffic class or type-of-service value.

**Since:**

1.4

**See Also:**

- setTrafficClass(int)
close

public void close()

Closes this datagram socket.

Any thread currently blocked in `#link receive` upon this socket will throw a `SocketException`.

If this socket has an associated channel then the channel is closed as well.

isClosed

public boolean isClosed()

Returns whether the socket is closed or not.

Returns:
true if the socket has been closed
Since: 1.4

getChannel

public DatagramChannel getChannel()

Returns the unique `DatagramChannel` object associated with this datagram socket, if any.

A datagram socket will have a channel if, and only if, the channel itself was created via the `DatagramChannel.open` method.

Returns:
the datagram channel associated with this datagram socket, or `null` if this socket was not created for a channel
Since: 1.4

setDatagramSocketImplFactory

public static void setDatagramSocketImplFactory(DatagramSocketImplFactory fac) throws IOException

Sets the datagram socket implementation factory for the application. The factory can be specified only once.

When an application creates a new datagram socket, the socket implementation factory's `createDatagramSocketImpl` method is called to create the actual datagram socket implementation.
Passing `null` to the method is a no-op unless the factory was already set.

If there is a security manager, this method first calls the security manager's `checkSetFactory` method to ensure the operation is allowed. This could result in a `SecurityException`.

**Parameters:**

- `fac` - the desired factory.

**Throws:**

- `IOException` - if an I/O error occurs when setting the datagram socket factory.
- `SocketException` - if the factory is already defined.
- `SecurityException` - if a security manager exists and its `checkSetFactory` method doesn't allow the operation.

**See Also:**

- `DatagramSocketImplFactory.createDatagramSocketImpl()`,
- `SecurityManager.checkSetFactory()`