The multicast datagram socket class is useful for sending and receiving IP multicast packets. A MulticastSocket is a (UDP) DatagramSocket, with additional capabilities for joining "groups" of other multicast hosts on the internet.

A multicast group is specified by a class D IP address and by a standard UDP port number. Class D IP addresses are in the range 224.0.0.0 to 239.255.255.255, inclusive. The address 224.0.0.0 is reserved and should not be used.

One would join a multicast group by first creating a MulticastSocket with the desired port, then invoking the `joinGroup(InetAddress groupAddr)` method:

```java
// join a Multicast group and send the group salutations
...
String msg = "Hello";
InetAddress group = InetAddress.getByName("228.5.6.7");
MulticastSocket s = new MulticastSocket(6789);
s.joinGroup(group);
DatagramPacket hi = new DatagramPacket(msg.getBytes(), msg.length(),
   group, 6789);
s.send(hi);
// get their responses!
byte[] buf = new byte[1000];
DatagramPacket recv = new DatagramPacket(buf, buf.length);
s.receive(recv);
// OK, I'm done talking - leave the group...
s.leaveGroup(group);
```

When one sends a message to a multicast group, all subscribing recipients to that host and port receive the message (within the time-to-live range of the packet, see below). The socket needn't be a member of the multicast group to send messages to it.

When a socket subscribes to a multicast group/port, it receives datagrams sent by other hosts to the group/port, as do all other members of the group and port. A socket relinquishes membership in a group by the `leaveGroup(InetAddress addr)` method. Multiple MulticastSocket's may subscribe to a multicast group and port concurrently, and they will all receive group datagrams.

Currently applets are not allowed to use multicast sockets.
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### Method Summary

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#### Deprecated Methods

- `send(DatagramPacket p, byte ttl)`
  - Use the following code or its equivalent instead: `... int ttl = mcastSocket.getTimeToLive(); mcastSocket.setTimeToLive(newttl); mcastSocket.send(p); mcastSocket.setTimeToLive(ttl); ...`

Since: JDK1.1
MulticastSocket

**public MulticastSocket()**

throws IOException

Create a multicast socket.

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.

When the socket is created the DatagramSocket.setReuseAddress(boolean) method is called to enable the SO_REUSEADDR socket option.

**Throws:**

- IOException - if an I/O exception occurs while creating the MulticastSocket
- SecurityException - if a security manager exists and its checkListen method doesn't allow the operation.

**See Also:**

SecurityManager.checkListen(int), DatagramSocket.setReuseAddress (boolean)

---

MulticastSocket

**public MulticastSocket(int port)**
Create a multicast socket and bind it to a specific port.

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.

When the socket is created the `DatagramSocket.setReuseAddress(boolean)` method is called to enable the SO_REUSEADDR socket option.

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

**Throws:**
- `IOException` - if an I/O exception occurs while creating the `MulticastSocket`
- `SecurityException` - if a security manager exists and its `checkListen` method doesn’t allow the operation.

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

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**MulticastSocket**

```java
public MulticastSocket(SocketAddress bindaddr)
    throws IOException
```

Create a MulticastSocket bound to the specified socket address.

Or, if the address is null, create an unbound socket.

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

When the socket is created the `DatagramSocket.setReuseAddress(boolean)` method is called to enable the SO_REUSEADDR socket option.

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

**Throws:**
- `IOException` - if an I/O exception occurs while creating the `MulticastSocket`
- `SecurityException` - if a security manager exists and its `checkListen` method doesn’t allow the operation.

**Since:**
1.4

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

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### Method Detail

**setTTL**
**setTTL(byte ttl)**

Deprecated. use the `setTimeToLive` method instead, which uses `int` instead of `byte` as the type for `ttl`.

Set the default time-to-live for multicast packets sent out on this `MulticastSocket` in order to control the scope of the multicasts.

The `ttl` is an **unsigned** 8-bit quantity, and so **must** be in the range `0 <= ttl <= 0xFF`.

**Parameters:**
- `ttl` - the time-to-live

**Throws:**
- `IOException` - if an I/O exception occurs while setting the default time-to-live value

**See Also:**
- `getTTL()`

---

**setTimeToLive**

**public void setTimeToLive(int ttl)**

Set the default time-to-live for multicast packets sent out on this `MulticastSocket` in order to control the scope of the multicasts.

The `ttl` **must** be in the range `0 <= ttl <= 255` or an `IllegalArgumentException` will be thrown.

**Parameters:**
- `ttl` - the time-to-live

**Throws:**
- `IOException` - if an I/O exception occurs while setting the default time-to-live value

**See Also:**
- `getTimeToLive()`

---

**getTTL**

```java
@Deprecated
public byte getTTL() throws IOException
```

Deprecated. use the `getTimeToLive` method instead, which returns an `int` instead of a `byte`.

Get the default time-to-live for multicast packets sent out on the socket.

**Returns:**
- the default time-to-live value

**Throws:**
- `IOException` - if an I/O exception occurs while getting the default time-to-live value
getTimeToLive

public int getTimeToLive() throws IOException

Get the default time-to-live for multicast packets sent out on the socket.

Returns:  
the default time-to-live value

Throws:  
IOException - if an I/O exception occurs while getting the default time-to-live value

See Also:  
setTimeToLive(int)

joinGroup

public void joinGroup(InetAddress mcastaddr) throws IOException

Joins a multicast group. Its behavior may be affected by setInterface or setNetworkInterface.

If there is a security manager, this method first calls its checkMulticast method with the mcastaddr argument as its argument.

Parameters:  
mcastaddr - is the multicast address to join

Throws:  
IOException - if there is an error joining or when the address is not a multicast address. SecurityException - if a security manager exists and its checkMulticast method doesn't allow the join.

See Also:  
SecurityManager.checkMulticast(InetAddress)

leaveGroup

public void leaveGroup(InetAddress mcastaddr) throws IOException

Leave a multicast group. Its behavior may be affected by setInterface or setNetworkInterface.

If there is a security manager, this method first calls its checkMulticast method with the mcastaddr argument as its argument.
**Parameters:**
- `mcastaddr` - is the multicast address to leave

**Throws:**
- `IOException` - if there is an error leaving or when the address is not a multicast address.
- `SecurityException` - if a security manager exists and its `checkMulticast` method doesn't allow the operation.

**See Also:**
- `SecurityManager.checkMulticast(InetAddress)`

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### `joinGroup`

```java
public void joinGroup(SocketAddress mcastaddr,
                      NetworkInterface netIf)
  throws IOException
```

Joins the specified multicast group at the specified interface.

If there is a security manager, this method first calls its `checkMulticast` method with the `mcastaddr` argument as its argument.

**Parameters:**
- `mcastaddr` - is the multicast address to join
- `netIf` - specifies the local interface to receive multicast datagram packets, or `null` to defer to the interface set by `setInterface(InetAddress)` or `setNetworkInterface(NetworkInterface)`

**Throws:**
- `IOException` - if there is an error joining or when the address is not a multicast address.
- `SecurityException` - if a security manager exists and its `checkMulticast` method doesn't allow the join.
- `IllegalArgumentException` - if `mcastaddr` is null or is a `SocketAddress` subclass not supported by this socket

**Since:**
- 1.4

**See Also:**
- `SecurityManager.checkMulticast(InetAddress)`

---

### `leaveGroup`

```java
public void leaveGroup(SocketAddress mcastaddr,
                       NetworkInterface netIf)
  throws IOException
```

Leave a multicast group on a specified local interface.

If there is a security manager, this method first calls its `checkMulticast` method with the `mcastaddr` argument as its argument.

**Parameters:**
- `mcastaddr` - is the multicast address to leave
- `netIf` - specifies the local interface or `null` to defer to the interface set by
setInterface(InetAddress) or setNetworkInterface(NetworkInterface)

Throws:
IOException - if there is an error leaving or when the address is not a multicast address.
SecurityException - if a security manager exists and its checkMulticast method doesn't allow the operation.
IllegalArgumentException - if mcastaddr is null or is a SocketAddress subclass not supported by this socket.

Since: 1.4

See Also: SecurityManager.checkMulticast(InetAddress)

setInterface

public void setInterface(InetAddress inf)
throws SocketException

Set the multicast network interface used by methods whose behavior would be affected by the value of the network interface. Useful for multihomed hosts.

Parameters:
inf - the InetAddress

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

See Also: getInterface()

getInterface

public InetAddress getInterface()
throws SocketException

Retrieve the address of the network interface used for multicast packets.

Returns:
An InetAddress representing the address of the network interface used for multicast packets.

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

See Also: setInterface(java.net.InetAddress)

setNetworkInterface

public void setNetworkInterface(NetworkInterface netIf)
throws SocketException

Specify the network interface for outgoing multicast datagrams sent on this socket.
Parameters:

netIf - the interface

Throws:

SocketException - if there is an error in the underlying protocol, such as a TCP error.

Since: 1.4

See Also:

getNetworkInterface()

getNetworkInterface

public NetworkInterface getNetworkInterface() throws SocketException

Get the multicast network interface set.

Returns:

the multicast NetworkInterface currently set

Throws:

SocketException - if there is an error in the underlying protocol, such as a TCP error.

Since: 1.4

See Also:

setNetworkInterface(NetworkInterface)

setLoopbackMode

public void setLoopbackMode(boolean disable) throws SocketException

Disable/Enable local loopback of multicast datagrams. The option is used by the platform's networking code as a hint for setting whether multicast data will be looped back to the local socket.

Because this option is a hint, applications that want to verify what loopback mode is set to should call getLoopbackMode().

Parameters:

disable - true to disable the LoopbackMode

Throws:

SocketException - if an error occurs while setting the value

Since: 1.4

See Also:

getLoopbackMode()

getLoopbackMode

public boolean getLoopbackMode()
Get the setting for local loopback of multicast datagrams.

**Returns:**
true if the LoopbackMode has been disabled

**Throws:**
SocketException - if an error occurs while getting the value

Since: 1.4

See Also:
setLoopbackMode(boolean)

---

**send**

@Deprecated
public void send(DatagramPacket p,
 byte ttl)

throws IOException

Deprecated. Use the following code or its equivalent instead: ...... int ttl =
mcastSocket.getTimeToLive(); mcastSocket.setTimeToLive(newttl); mcastSocket.send(p);
mcastSocket.setTimeToLive(ttl); ......

Sends a datagram packet to the destination, with a TTL (time- to-live) other than the default for the socket. This method need only be used in instances where a particular TTL is desired; otherwise it is preferable to set a TTL once on the socket, and use that default TTL for all packets. This method does not alter the default TTL for the socket. Its behavior may be affected by setInterface.

If there is a security manager, 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() and ttl as its arguments. 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 - is the packet to be sent. The packet should contain the destination multicast ip address and the data to be sent. One does not need to be the member of the group to send packets to a destination multicast address.
ttl - optional time to live for multicast packet. default ttl is 1.

**Throws:**
IOException - is raised if an error occurs i.e error while setting ttl.
SecurityException - if a security manager exists and its checkMulticast or checkConnect method doesn't allow the send.

**See Also:**
DatagramSocket.send(java.net.DatagramPacket), DatagramSocket.receive
(java.net.DatagramPacket), SecurityManager.checkMulticast
(java.net.InetAddress, byte), SecurityManager.checkConnect
(java.lang.String, int)