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Configuring IRDP

About IRDP

ICMP Router Discovery Protocol (IRDP), an extension of the ICMP, is independent of any routing protocol. It allows hosts to discover the IP addresses of neighboring routers that can act as default gateways to reach devices on other IP networks.

IRDP enables hosts to track dynamic changes in router availability. It does not require you to configure the default gateways on hosts or configure hosts to listen to routing protocols to obtain IP addresses of routers.

IRDP operation

IRDP uses the following types of ICMP messages:

- **Router advertisement (RA)**—Sent by a router to advertise IP addresses (including the primary and secondary IP addresses) and preference.
- **Router solicitation (RS)**—Sent by a host to request the IP addresses of routers on the subnet.

An interface with IRDP enabled periodically broadcasts or multicasts an RA message to advertise its IP addresses and their preferences. A receiving host adds the IP addresses to its routing table, and selects the IP address with the highest preference as the default gateway.

When a host attached to the subnet starts up, the host multicasts an RS message to request immediate advertisements. If the host does not receive any advertisements, it retransmits the RS several times. If the host does not discover the IP addresses of neighboring routers because of network problems, the host can still discover them from periodic RAs.

IRDP allows hosts to discover neighboring routers, but it does not suggest the best route to a destination. If a host sends a packet to a router that is not the best next hop, the host will receive an ICMP redirect message from the router.

Protocols and standards

RFC 1256: *ICMP Router Discovery Messages*

IRDP tasks at a glance

To configure IRDP, perform the following tasks:

1. [Enabling IRDP](#)
2. (Optional.) [Specifying the preference of advertised IP addresses](#)
3. (Optional.) [Setting the lifetime of advertised IP addresses](#)
4. (Optional.) [Setting the advertising intervals](#)
5. (Optional.) [Specifying the multicast address as the destination address for RAs](#)
6. (Optional.) [Specifying a proxy-advertised IP address](#)

Restrictions and guidelines: IRDP configuration

- IRDP takes effect on any Layer 3 interface (except the loopback interface) if the interface has an IP address.
- After IRDP is enabled on an interface, the IRDP configurations take effect, and the device sends RA messages out of the interface.

Enabling IRDP

1. Enter system view.
system-view
2. Enter interface view.
interface *interface-type interface-number*
3. Enable IRDP on the interface.
ip irdp

By default, IRDP is disabled on an interface.

Specifying the preference of advertised IP addresses

About specifying the preference of advertised IP addresses

Every IP address advertised in RAs has a preference value. A larger preference value represents a higher preference. The IP address with the highest preference is selected as the default gateway address.

You can specify the preference for IP addresses to be advertised on a router interface.

An address with the minimum preference value (-2147483648) will not be used as a default gateway address.

Procedure

1. Enter system view.
system-view
2. Enter interface view.
interface *interface-type interface-number*
3. Specify the preference of advertised primary and secondary IP addresses on the interface.
ip irdp preference *preference-value*

The default preference is 0.

The preference applies to all advertised primary and secondary IP addresses on the interface.

Setting the lifetime of advertised IP addresses

About the lifetime of advertised IP addresses

An RA contains a lifetime field that specifies the lifetime of advertised IP addresses. If the host does not receive a new RA for an IP address within the address lifetime, the host removes the route entry.

All the IP addresses advertised by an interface, including proxy-advertised IP addresses and the interface IP address, have the same lifetime.

Procedure

1. Enter system view.
system-view
2. Enter interface view.
interface *interface-type interface-number*
3. Set the lifetime of advertised IP addresses.
ip irdp lifetime *lifetime-value*
The default lifetime is 1800 seconds.
The lifetime cannot be shorter than the maximum advertising interval.

Setting the advertising intervals

About setting the advertising intervals

A router interface with IRDP enabled sends out RAs randomly between the minimum and maximum advertising intervals. This mechanism prevents the local link from being overloaded by a large number of RAs sent simultaneously from routers.

As a best practice, shorten the advertising interval on a link that suffers high packet loss rates.

Procedure

1. Enter system view.
system-view
2. Enter interface view.
interface *interface-type interface-number*
3. Set the maximum and minimum advertising intervals.
ip irdp interval *max-interval* [*min-interval*]
By default, the maximum interval is 600 seconds, and the minimum interval is 3/4 of the maximum interval.

Specifying the multicast address as the destination address for RAs

About specifying the multicast address as the destination address for RAs

An RA uses either of the following destination IP addresses:

- Broadcast address 255.255.255.255.
- Multicast address 224.0.0.1, which identifies all hosts on the local link.

By default, the destination IP address of an RA is the broadcast address. If all listening hosts in a local area network support IP multicast, specify 224.0.0.1 as the destination IP address.

Procedure

1. Enter system view.
system-view
2. Enter interface view.
interface *interface-type interface-number*

3. Specify the multicast address 224.0.0.1 as the destination IP address of RAs.
`ip irdp multicast`
By default, RAs use the broadcast address 255.255.255.255 as the destination IP address.

Specifying a proxy-advertised IP address

About specifying a proxy-advertised IP address

By default, an interface advertises its primary and secondary IP addresses. You can specify IP addresses of other gateways for an interface to proxy-advertise.

Procedure

1. Enter system view.
`system-view`
2. Enter interface view.
`interface interface-type interface-number`
3. Specify a proxy-advertised IP address and its preference.
`ip irdp address ip-address preference-value`

By default, no proxy-advertised IP address is specified.

You can repeat this command to specify a maximum of four proxy-advertised IP addresses on an interface.

IRDP configuration examples

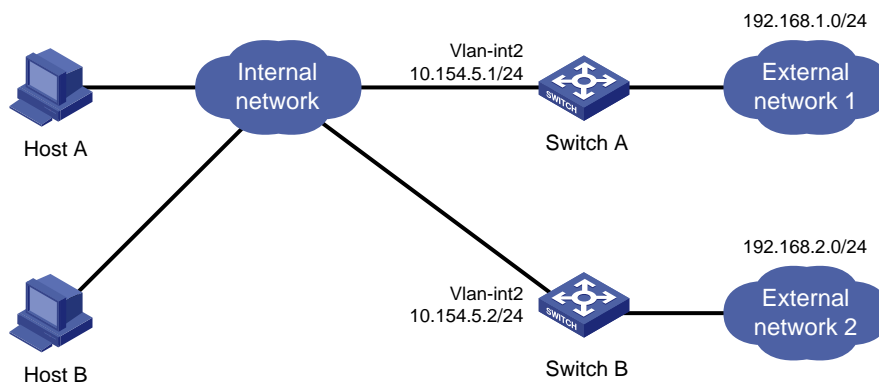
Example: Configuring IRDP

Network configuration

As shown in [Figure 1](#), Host A and Host B that run Linux support IRDP, and they are in the internal network. Switch A and Switch B act as the egress routers and connect to external networks 192.168.1.0/24 and 192.168.2.0/24, respectively.

Configure Switch A as the default gateway for the hosts. Make sure Switch A has routes to reach both External network 1 and External network 2, so that packets to these external networks can be correctly routed.

Figure 1 Network diagram



Procedure

1. Configure Switch A:

Configure a route for Switch A to reach External network 2. (Details not shown.)

Specify an IP address for VLAN-interface 2.

```
<SwitchA> system-view
[SwitchA] interface vlan-interface 2
[SwitchA-Vlan-interface2] ip address 10.154.5.1 24
```

Enable IRDP on VLAN-interface 2.

```
[SwitchA-Vlan-interface2] ip irdp
```

Specify preference 1000 for advertised IP addresses on VLAN-interface 2.

```
[SwitchA-Vlan-interface2] ip irdp preference 1000
```

Specify the multicast address 224.0.0.1 as the destination IP address for RAs sent by VLAN-interface 2.

```
[SwitchA-Vlan-interface2] ip irdp multicast
```

Specify the IP address 192.168.1.0 and preference 400 for VLAN-interface 2 to proxy-advertise.

```
[SwitchA-Vlan-interface2] ip irdp address 192.168.1.0 400
```

2. Configure Switch B:

Specify an IP address for VLAN-interface 2.

```
<SwitchB> system-view
[SwitchB] interface vlan-interface 2
[SwitchB-Vlan-interface2] ip address 10.154.5.2 24
```

Enable IRDP on VLAN-interface 2.

```
[SwitchB-Vlan-interface2] ip irdp
```

Specify preference 500 for advertised IP addresses on VLAN-interface 2.

```
[SwitchB-Vlan-interface2] ip irdp preference 500
```

Specify the multicast address 224.0.0.1 as the destination IP address for RAs sent by VLAN-interface 2.

```
[SwitchB-Vlan-interface2] ip irdp multicast
```

Specify the IP address 192.168.2.0 and preference 400 for VLAN-interface 2 to proxy-advertise.

```
[SwitchB-Vlan-interface2] ip irdp address 192.168.2.0 400
```

Verifying the configuration

Display the routing table for Host A.

```
[HostA@localhost ~]$ netstat -rne
```

Kernel IP routing table

Destination	Gateway	Genmask	Flags	Metric	Ref	Use	Iface
10.154.5.0	0.0.0.0	255.255.255.0	U	0	0	0	eth1
192.168.1.0	0.0.0.0	255.255.255.0	U	0	0	0	eth1
192.168.2.0	0.0.0.0	255.255.255.0	U	0	0	0	eth1
0.0.0.0	10.154.5.1	0.0.0.0	UG	0	0	0	eth1

The output shows that the default route on Host A points to IP address 10.154.5.1, and Host A has routes to 192.168.1.0/24 and 192.168.2.0/24.

Display the routing table for Host B.

```
[HostB@localhost ~]$ netstat -rne
```

Kernel IP routing table

Destination	Gateway	Genmask	Flags	Metric	Ref	Use	Iface
-------------	---------	---------	-------	--------	-----	-----	-------

```
10.154.5.0      0.0.0.0      255.255.255.0  U    0    0    0 eth1
192.168.1.0    0.0.0.0      255.255.255.0  U    0    0    0 eth1
192.168.2.0    0.0.0.0      255.255.255.0  U    0    0    0 eth1
0.0.0.0        10.154.5.1   0.0.0.0        UG   0    0    0 eth1
```

The output shows that the default route on Host B points to IP address 10.154.5.1, and Host B has routes to 192.168.1.0/24 and 192.168.2.0/24.