Integrated Services

These two models are designed to provide Quality of Service (QoS) in the network.

1. Integrated Services(IntServ)

Integrated service is flow-based QoS model and designed for **IP**.
In integrated services, user needs to create a flow in the network, from source to destination and needs to inform all routers (every router in the system implements **IntServ**) of the resource requirement.

Following are the steps to understand how integrated services works.

I) Resource Reservation Protocol (RSVP)
An IP is connectionless, datagram, packet-switching protocol. To implement a flow-based model, a signaling protocol is used to run over **IP**, which provides the signaling mechanism to make reservation (every applications need assurance to make reservation), this protocol is called as **RSVP**.

ii) Flow Specification
While making reservation, resource needs to define the flow specification. The flow specification has two parts:
a) Resource specification
It defines the resources that the flow needs to reserve. For example: Buffer, bandwidth, etc.
b) Traffic specification
It defines the traffic categorization of the flow.

iii) Admit or deny
After receiving the flow specification from an application, the **router decides to admit or deny the service** and the decision can be taken based on the previous commitments of the router and current availability of the resource.

Resource Reservation Protocol (RSVP)

- The RSVP is a signaling protocol, which helps IP to create a flow and to make resource reservation.

- It is an independent protocol and also can be used in other different model.

- RSVP helps to design **multicasting** (one to many or many to many distribution), where a data can be sent to group of destination computers simultaneously.
  For example: The IP multicast is technique for one to many communication through an IP infrastructure in the network.

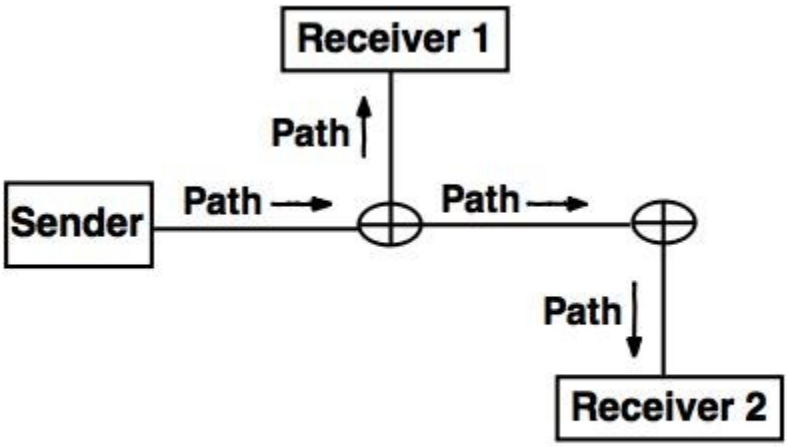
- RSVP can be also used for **unicasting** (transmitting a data to all possible destination) to provide resource reservation for all types of traffic.

The two important types of RSVP messages are:

1. Path messages:

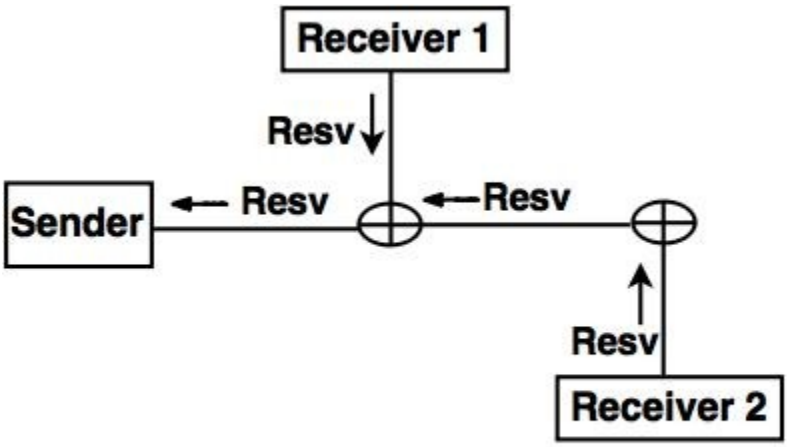
- The receivers in a flow make the reservation in RSVP, but the receivers do not know the path traveled by the packets before the reservation. The path is required for reservation To solve this problem the RSVP uses the path messages.

- A path message travels from the sender and reaches to all receivers by multicasting and path message stores the necessary information for the receivers.



Path messages

2. Resv messages:
After receiving path message, the receiver sends a Resv message. The Resv message travels to the sender and makes a resource reservation on the routers which supports for RSVP.



Resv Messages

Classification of services

The two classes of services to define Integrated Services are:

a) Guaranteed Service Class
This service guarantees that the packets arrive within a specific delivery time and not discarded, if the traffic flow maintains the traffic specification boundary.
This type of service is designed for real time traffic, which needs a guaranty of minimum end to end delay.
For example: Audio conferencing.

b) Controlled Load Service Class
This type of service is designed for the applications, which can accept some delays, but are sensitive to overload network and to the possibility to lose packets.
For example: E-mail or file transfer.

Problems with Integrated Services.

The two problems with the Integrated services are:

i) Scalability
In Integrated Services, it is necessary for each router to keep information of each flow. But, this is not always possible due to growing network.

ii) Service- Type Limitation
The integrated services model provides only two types of services, guaranteed and control-load.