

1. What are unicast and broadcast?

Unicast

1. Traffic is sent from one host to another. A replica of each packet in the data stream goes to every host that requests it.
2. The implementation of unicast applications is a bit easy as they use well-established IP protocols; however, they are particularly incompetent when there is a need for many-to-many communications. In the meantime, all packets in the data stream must be sent to every host requesting access to the data stream. However, this type of transmission is ineffective in terms of both network and server resources as it equally presents obvious scalability issues.
3. This is a one-to-one connection between the client and the server. Unicast uses IP provision techniques such as TCP (transmission control protocol) and UDP (user datagram protocol), which are session-based protocols. Once a Windows media player client connects via unicast to a Windows media server that client gets a straight connection to the server. Every unicast client that connects to the server takes up extra bandwidth. For instance, if you have 10 clients all performing 100 Kbps (kilobits per second) streams, it means those clients taking up 1,000 Kbps. But you have a single client using the 100 Kbps stream, only 100 Kbps is being used.


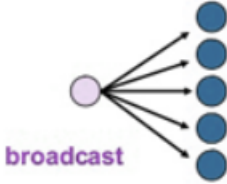
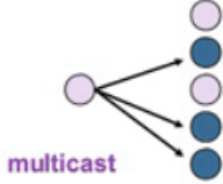
Broadcast:

Here, traffic streams from a single point to all possible endpoints within reach on the network, which is generally a LAN. This is the easiest technique to ensure traffic reaches its destinations.

This mode is mainly utilized by television networks for video and audio distribution. Even if the television network is a cable television (CATV) system, the source signal reaches all possible destinations, which is the key reason that some channels' content is scrambled. Broadcasting is not practicable on the public Internet due to the massive amount of unnecessary data that would continually

reach each user's device, the complications and impact of scrambling, and related privacy issues.

What are the differences between unicast, multicast, and broadcast?

Unicast	Broadcast	Multicast
from one source to one destination.	from one source to all possible destinations.	from one source to multiple destinations stating an interest in receiving the traffic.
One-to-One	One-to-All	One-to-Many
		

2. What are java Generics and wildcards?

Generics in Java

Generics mean parameterized types. The idea is to allow type (Integer, String, ... etc, and user-defined types) to be a parameter to methods, classes, and interfaces. Using Generics, it is possible to create classes that work with different data types.

An entity such as class, interface, or method that operates on a parameterized type is called a generic entity.

Why Generics?

The Object is the superclass of all other classes and Object reference can refer to any type object. These features lack type safety. Generics add that type safety feature. We will discuss that type of safety feature in later examples.

Generics in Java is similar to templates in C++. For example, classes like HashSet, ArrayList, HashMap, etc use generics very well. There are some fundamental differences between the two approaches to generic types.

Generic Class

Like C++, we use <> to specify parameter types in generic class creation. To create objects of a generic class, we use the following syntax.

```
// To create an instance of generic class
```

```
BaseType <Type> obj = new BaseType <Type>()
```

Note: In Parameter type we can not use primitives like

'int','char' or 'double'.

Generic Functions:

We can also write generic functions that can be called with different types of arguments based on the type of arguments passed to the generic method, the compiler handles each method.

Generics work only with Reference Types:

When we declare an instance of a generic type, the type argument passed to the type parameter must be a reference type. We cannot use primitive data types like int, char.

Wildcards in Java

The question mark (?) is known as the wildcard in generic programming . It represents an unknown type. The wildcard can be used in a variety of situations such as the type of a parameter, field, or local variable; sometimes as a return type. Unlike arrays, different instantiations of a generic type are not compatible with each other, not even explicitly. This incompatibility may be softened by the wildcard if ? is used as an actual type parameter.

Types of wildcards in Java:

Upper Bounded Wildcards:

These wildcards can be used when you want to relax the restrictions on a variable. For example, say you want to write a method that works on `List < integer >`, `List < double >`, and `List < number >`, you can do this using an upper bounded wildcard.

To declare an upper-bounded wildcard, use the wildcard character ('?'), followed by the `extends` keyword, followed by its upper bound.

```
public static void add(List<? extends Number> list).
```

Lower Bounded Wildcards:

It is expressed using the wildcard character ('?'), followed by the `super` keyword, followed by its lower bound: `<? super A>`.

Syntax: `Collectiontype <? super A>`

Unbounded Wildcard:

This wildcard type is specified using the wildcard character (?), for example, `List`. This is called a list of unknown type. These are useful in the following cases

When writing a method which can be employed using functionality provided in Object class. When the code is using methods in the generic class that don't depend on the type parameter

What is the difference between array list and enums?

enum in Java

Enumerations serve the purpose of representing a group of named constants in a programming language. For example, the 4 suits in a deck of playing cards may be 4 enumerators named Club, Diamond, Heart, and Spade, belonging to an enumerated type named Suit. Other examples include natural enumerated types (like the planets, days of the week, colors, directions, etc.).

Enums are used when we know all possible values at compile time, such as choices on a menu, rounding modes, command line flags, etc. It is not necessary that the set of constants in an enum type stay fixed for all time.

Ex :

```
enum Color
{
    RED, GREEN, BLUE;
}

public class Test
{
    // Driver method
    public static void main(String[] args)
    {
        Color c1 = Color.RED;
        System.out.println(c1);
    }
}
```

ArrayList in Java

ArrayList is a part of collection framework and is present in java.util package. It provides us with dynamic arrays in Java. Though, it may be slower than standard arrays but can be helpful in programs where lots of manipulation in the array is needed. This class is found in java.util package.