

Object Identity

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The Ice::Identity Type

Each Ice object has an object identity defined as follows:

Slice

```
module Ice {
    struct Identity {
        string name;
        string category;
    };
};
```

As you can see, an object identity consists of a pair of strings, a name and a category. The complete object identity is the combination of name and category, that is, for two identities to be equal, both name and category must be the same. The category member is usually the empty string, unless you are using [servant locators](#) or [default servants](#).



[Glacier2](#) also uses the category member for filtering.

If name is an empty string, category must be the empty string as well. (An identity with an empty name and a non-empty category is illegal.) If a proxy contains an identity in which name is empty, Ice interprets that proxy as a null proxy.

Object identities can be represented as strings; the category part appears first and is followed by the name; the two components are separated by a / character, for example:

```
Factory/File
```

In this example, Factory is the category, and File is the name. If the name or category member themselves contain a / character, the stringified representation escapes the / character with a \, for example:

```
Factories\Factory/Node\File
```

In this example, the category is Factories/Factory and the name is Node/File.

Syntax for Stringified Identities

You rarely need to write identities as strings because, typically, your code will be using the [identity helper functions](#) `identityToString` and `stringToIdentity`, or simply deal with proxies instead of identities. However, on occasion, you will need to use stringified identities in configuration files. If the identities happen to contain meta-characters (such as a slash or backslash), or characters outside the printable ASCII range, these characters must be escaped in the stringified representation. Here are rules that the Ice run time applies when parsing a stringified identity:

1. The parser scans the stringified identity for an unescaped slash character (/). If such a slash character can be found, the substrings to the left and right of the slash are parsed as the category and name members of the identity, respectively; if no such slash character can be found, the entire string is parsed as the name member of the identity, and the category member is the empty string.
2. Each of the category (if present) and name substrings is parsed according to the following rules:
 - All characters in the string must be in the ASCII range 32 (space) to 126 (~); characters outside this range cause the parse to fail.
 - Any character that is not part of an escape sequence is treated as that character.
 - The parser recognizes the following escape sequences and replaces them with their equivalent character:
 - \\ (backslash)

- \ ' (single quote)
- \ " (double quote)
- \ b (space)
- \ f (form feed)
- \ n (new line)
- \ r (carriage return)
- \ t (tab)
- An escape sequence of the form \o, \ooo, or \ooo (where o is a digit in the range 0 to 7) is replaced with the ASCII character with the corresponding octal value. Parsing for octal digits allows for at most three consecutive digits, so the string \0763 is interpreted as the character with octal value 76 (>) followed by the character 3. Parsing for octal digits terminates as soon as it encounters a character that is not in the range 0 to 7, so \7x is the character with octal value 7 (bell) followed by the character x. Octal escape sequences must be in the range 0 to 255 (octal 000 to 377); escape sequences outside this range cause a parsing error. For example, \539 is an illegal escape sequence.
- If a character follows a backslash, but is not part of a recognized escape sequence, the backslash is ignored, so \x is the character

Identity Helper Functions

To make conversion of identities to and from strings easier, the `Communicator` interface provides appropriate conversion functions:

Slice

```
local interface Communicator {
    string identityToString(Identity id);
    Identity stringToIdentity(string id);
};
```

For C++, Ruby, and PHP, the operations on the communicator are the only way to convert between identities and strings. For other languages, the conversion functions are provided as operations on the communicator as well but, in addition, the language mappings provide static utility functions. (The utility functions have the advantage that you can call them without holding a reference to the communicator.)



For C++, the static utility functions are not provided due to the need to apply string conversions, and the [string converters](#) are registered on the communicator.

For Java, the utility functions are in the `Ice.Util` class and are defined as:

Java

```
package Ice;

public final class Util {
    public static String  identityToString(Identity id);
    public static Identity stringToIdentity(String s);
}
```

For C#, the utility functions are in the `Ice.Util` class and are defined as:

C#

```
namespace Ice
{
    public sealed class Util
    {
        public static string  identityToString(Identity id);
        public static Identity stringToIdentity(string s);
    }
}
```

The Python functions are in the `Ice` module:

Python

```
def identityToString(ident)
def stringToIdentity(str)
```

These functions correctly encode and decode characters that might otherwise cause problems (such as control characters).

As mentioned in [Servant Activation and Deactivation](#), each entry in the ASM for an object adapter must be unique: you cannot add two servants with the same identity to the ASM.

See Also

- [Servant Activation and Deactivation](#)
- [Servant Locators](#)
- [Default Servants](#)
- [C++ Strings and Character Encoding](#)
- [Glacier2](#)