

# Global Unique Identifier

## Bionet GUID Generator

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- Global unique identifier (GUID) is used to
  - identify CEs.
  - distinguish different discovery messages.
  - identify any other bionet platform components.
- GUID generator creates GUIDs.
  - The bionet lifecycle service uses the generator to assign GUIDs to CEs.
  - Each CE uses the generator to assign GUIDs to discovery messages that it issues.

## GUID Generator Interface

```
package edu.uci.ics.bionet.util.guid;  
public interface GUIDGenerator  
{  
    public String getGUID();  
}
```

`getGUID()` returns a GUID in a string value.

All concrete GUID generators must implement this interface.

## Incremental GUID Generator

- Incremental GUID generator is a simple GUID generator that implements the GUID generator interface.
  - `edu.uci.ics.util.guid.IncrementalGUIDGenerator`
  - An integer value is incremented after a GUID is generated.
  - The generated GUID is returned in a string representation.
  - The GUIDs created by this generator are temporally unique, but not spatially unique.
  - This generator is used for some testing purpose.
    - Do not use it for any production purpose.

# NetworkAware32digitsGUIDGenerator

NetworkAware32digitsGUIDGenerator is another GUID generator that implements the GUID generator interface.

- edu.uci.ics.util.guid.NetworkAware32digitsGUIDGenerator
- A 32-digits string data made from hexadecimal representations of
  - IP address
  - identity hash code of the (singleton) GUID generator instance
    - obtained through calling `System.identityHashCode()`
  - the current time in milliseconds
  - a random number
    - generated using `java.util.Random` or `java.security.SecureRandom`.
      - » The default option is to use `java.util.Random` (because of its efficiency).
- The generated GUID is returned in a string representation.
- The GUIDs created by this generator keep temporal and spatial uniqueness.
- This generator can be used for production purpose.