

# Introducción a D-Bus



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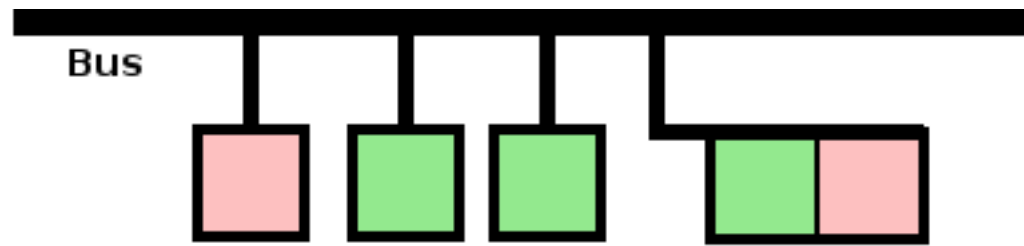


# Introducción a D-Bus

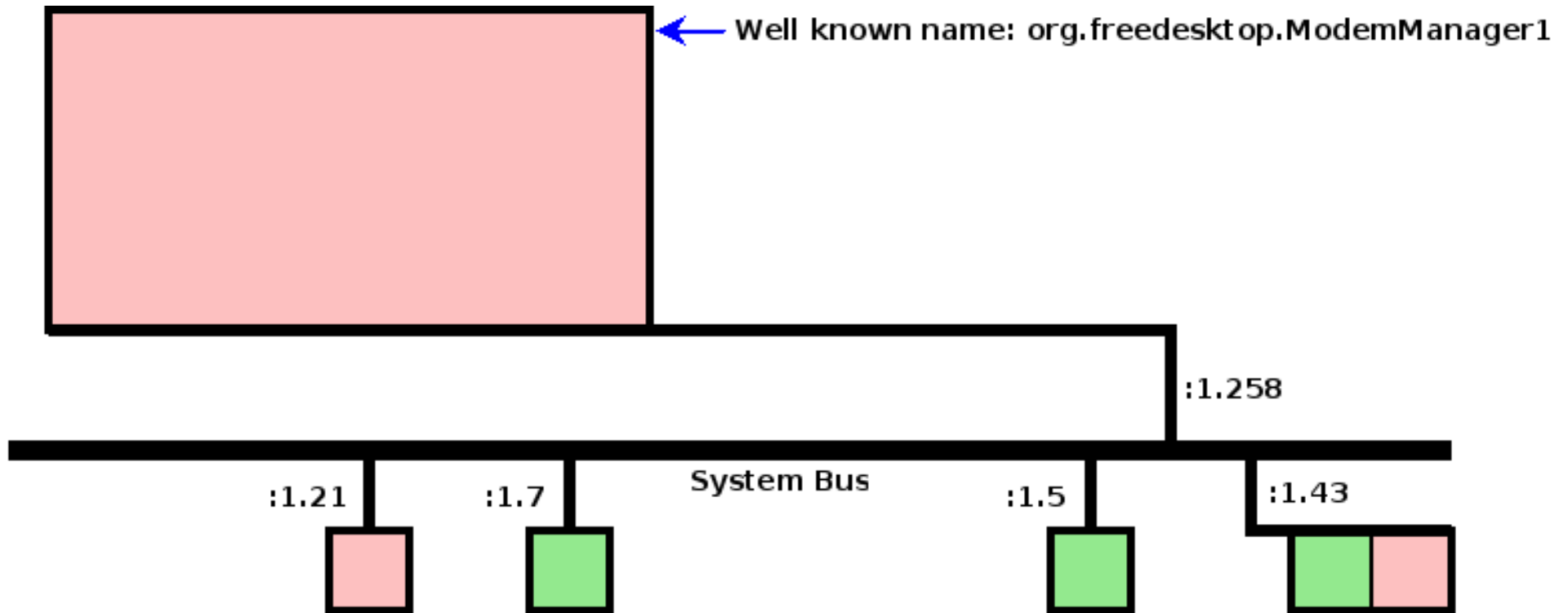
0. ¿Qué es D-Bus?
1. Arquitectura
2. Casos de uso
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4. Ejemplo: servicio en C, con gdbus-codegen
5. Ejemplo: clientes en python y javascript
6. Otras herramientas: d-feet, dbus-monitor, dbus-send

## 0. ¿Qué es D-Bus?

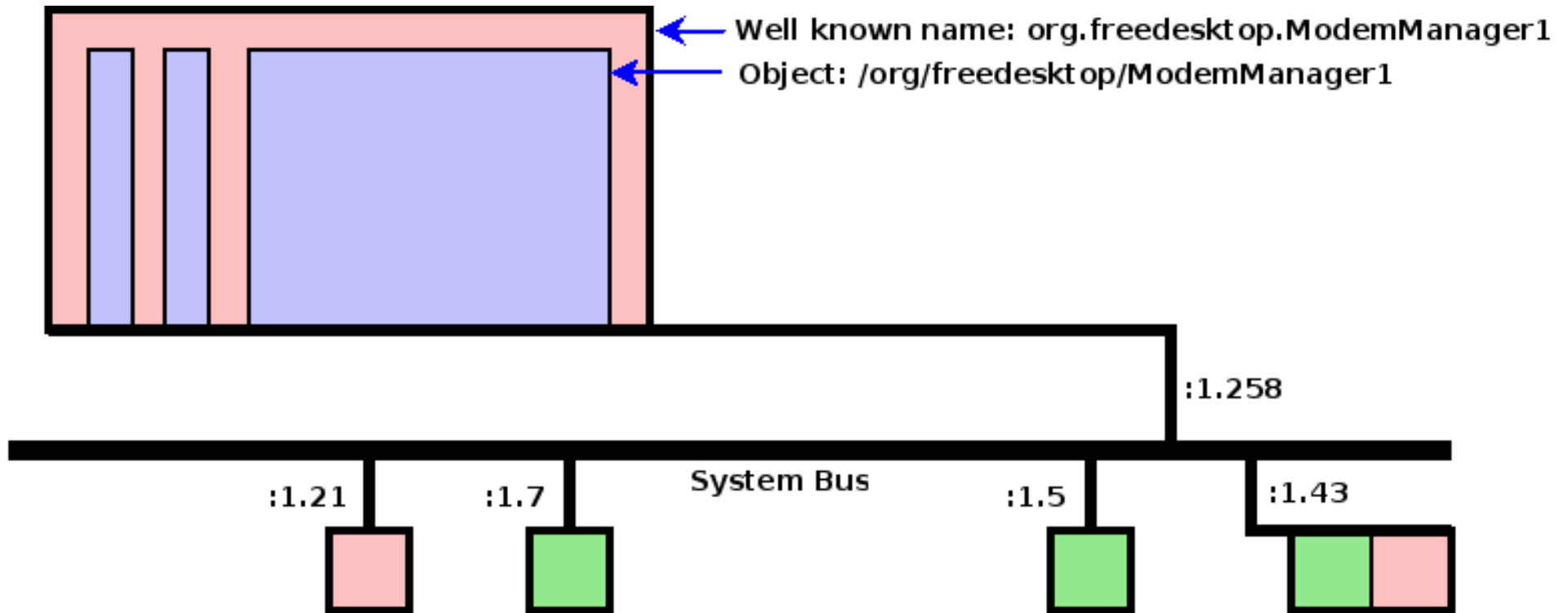
- IPC (com. entre procesos) de alto nivel
  - Multicast & point-to-point
  - Independiente del SO, de la arquitectura y del lenguaje de programación
  - Bus de sistema vs Bus de sesión
- [freedesktop.org](http://freedesktop.org)
  - GNOME, KDE, xfce



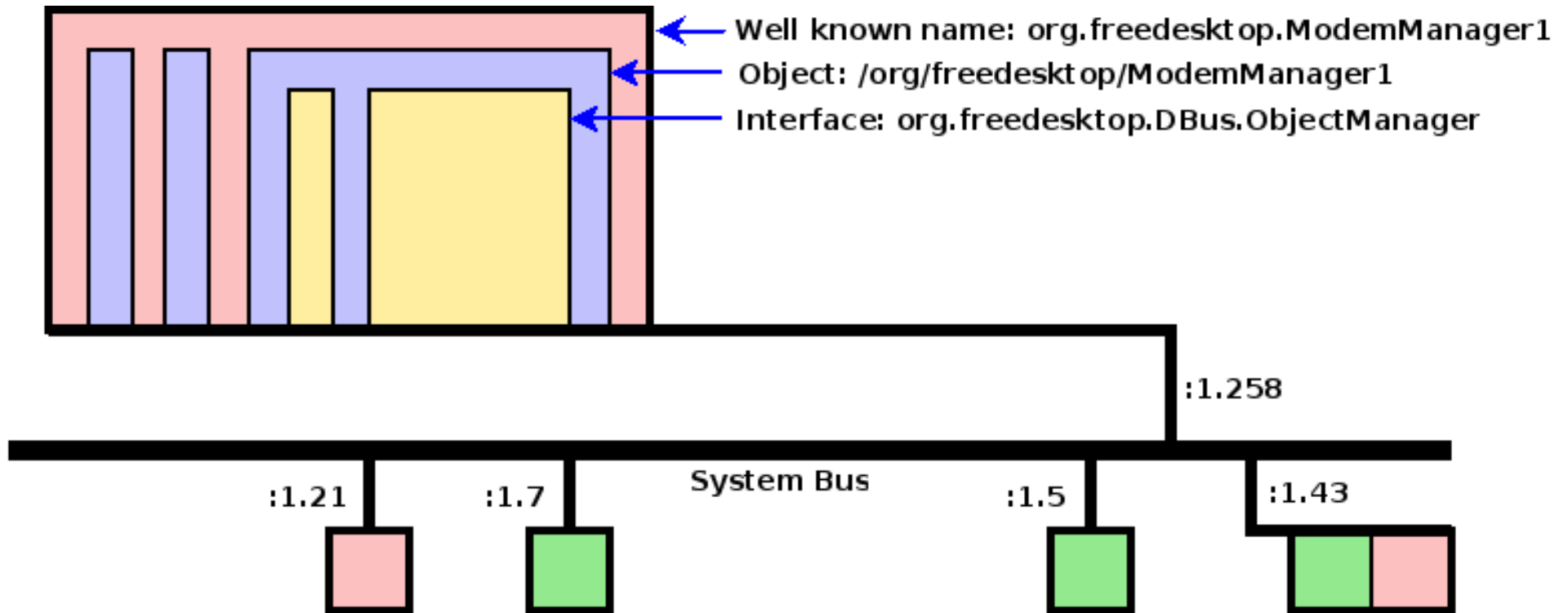
## 1. Arquitectura



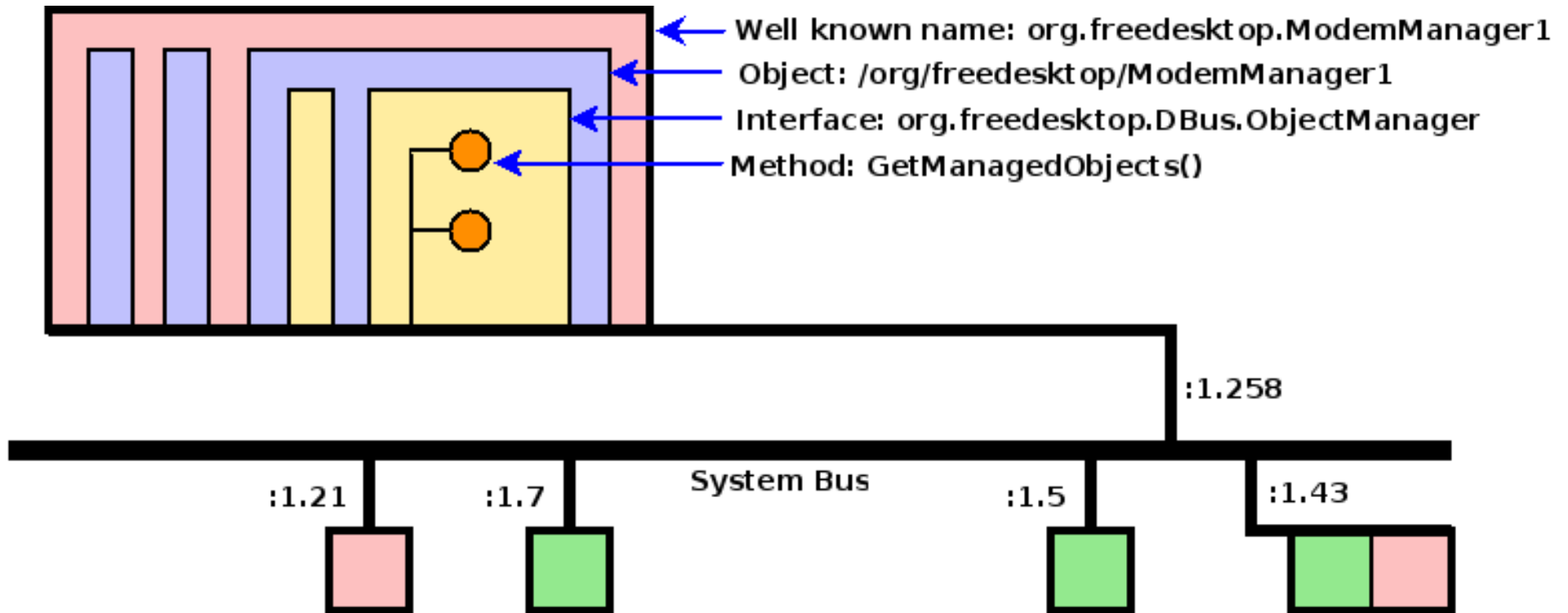
## 1. Arquitectura



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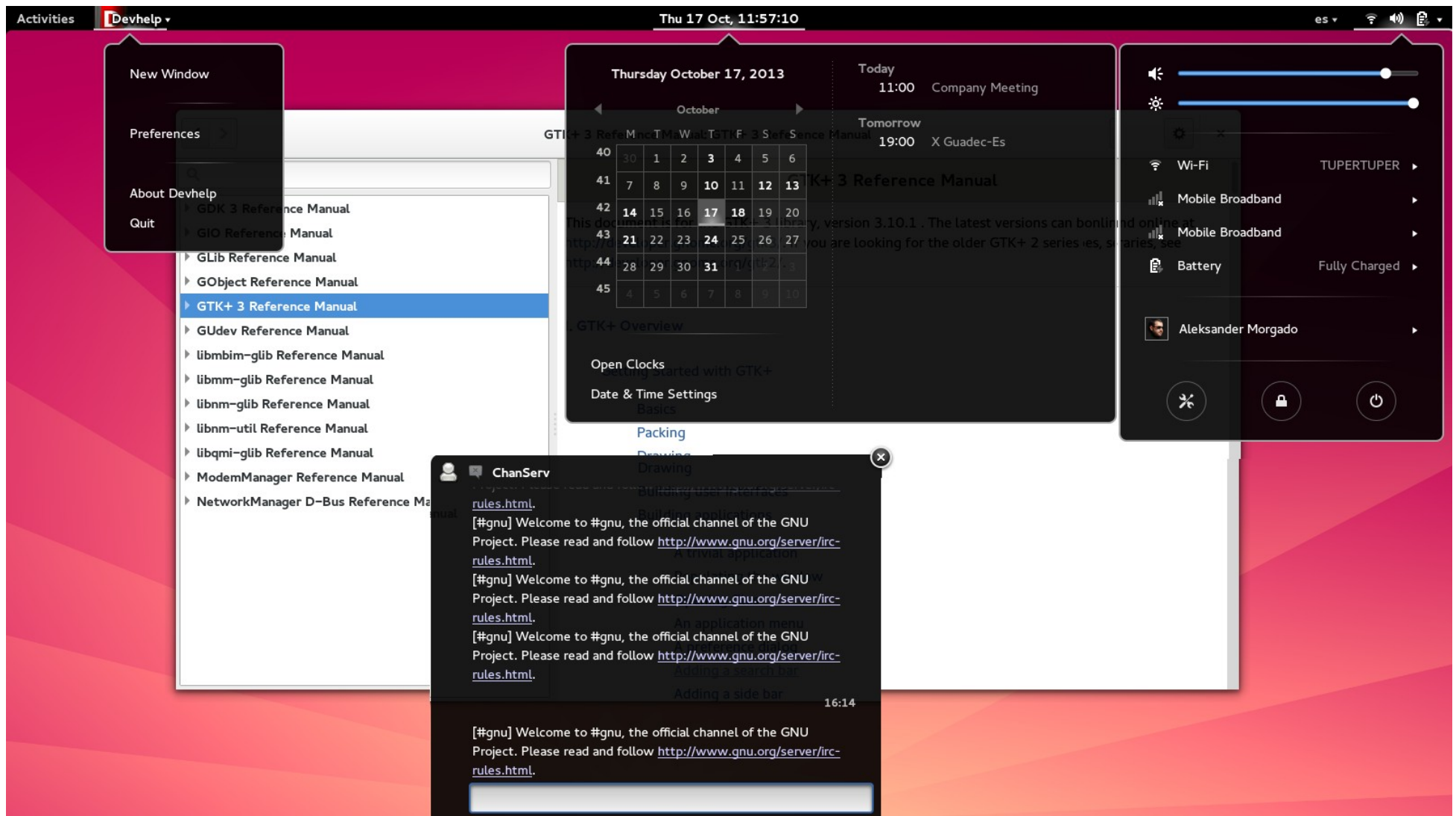




# 1. Arquitectura

- Nombre único
  - Servidores: nombre bien conocido
    - Objetos
      - Interfaces
        - Métodos
        - Propiedades (r/w)
        - Señales

## 2. Casos de uso



## 3. GDBus

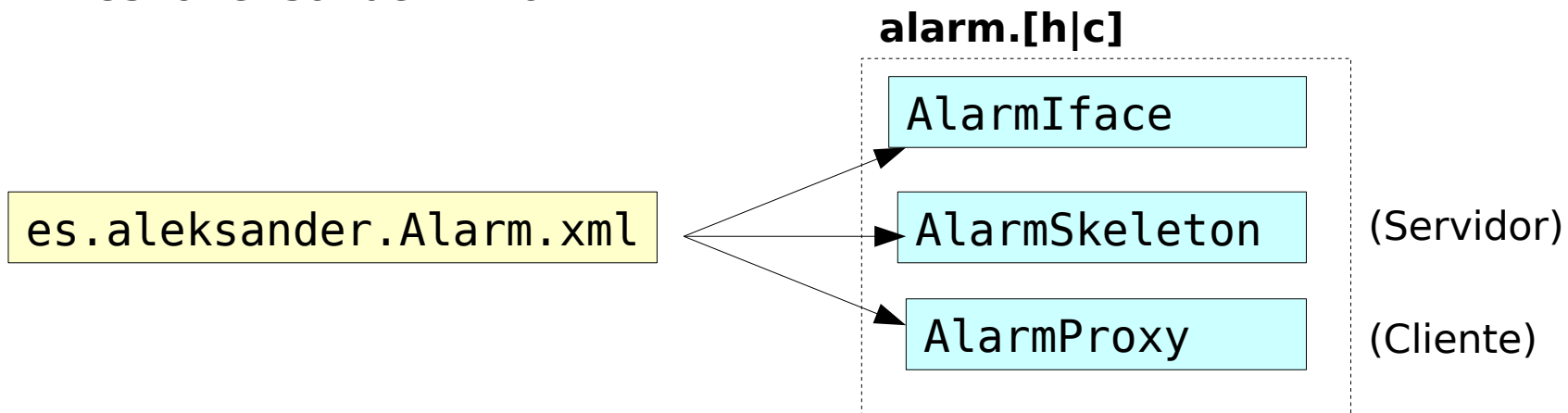
- Disponible en Glib/GIO  $\geq 2.30$ 
  - Reemplazo de dbus-glib
- GObject Introspection --> JS, Python...
- GVariant
- Soporte nativo para:
  - `org.freedesktop.Dbus.Properties`
  - `org.freedesktop.Dbus.ObjectManager`
- `gdbus-codegen`

## 4. Ejemplo: Servicio

```
<?xml version="1.0" encoding="UTF-8" ?>
<node name="/" xmlns:doc="http://www.freedesktop.org/dbus/1.0/doc.dtd">
  <interface name="es.aleksander.Alarm">
    <method name="Configure">
      <arg name="seconds" type="u" direction="in" />
    </method>
    <property name="Activated" type="b" access="read" />
    <signal name="Beeeeeeeeeep" />
  </interface>
</node>
```

## 4. Ejemplo: gdbus-codegen

```
$ gdbus-codegen \  
  --interface-prefix es.aleksander \  
  --generate-c-code alarm \  
  es.aleksander.Alarm.xml
```



```
void main (void)
{
    GMainLoop *loop;

    loop = g_main_loop_new (NULL, FALSE);
    g_bus_own_name (G_BUS_TYPE_SESSION,
                  "es.aleksander.Alarm",
                  G_BUS_NAME_OWNER_FLAGS_NONE,
                  NULL,
                  on_name_acquired,
                  NULL,
                  NULL,
                  NULL);
    g_main_loop_run (loop);
}
```

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
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```
static void
on_name_acquired (GDBusConnection *connection,
                  const gchar *name,
                  gpointer user_data)
{
    Alarm *skeleton;

    skeleton = alarm_skeleton_new ();
    g_signal_connect (skeleton,
                    "handle-configure",
                    G_CALLBACK (on_handle_configure),
                    NULL);

    g_dbus_interface_skeleton_export (G_DBUS_INTERFACE_SKELETON (skeleton),
                                     connection,
                                     "/es/aleksander/Alarm",
                                     NULL);
}
```

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```
static gboolean
on_handle_configure (Alarm *skeleton,
                     GDBusMethodInvocation *invocation,
                     guint seconds,
                     gpointer user_data)
{
    if (alarm_get_activated (skeleton)) {
        g_dbus_method_invocation_return_error_literal (
            invocation, G_IO_ERROR, G_IO_ERROR_EXISTS, "Exists");
        return;
    }

    alarm_set_activated (skeleton, TRUE);
    g_timeout_add_seconds (seconds, emit_alarm_cb, skeleton);
    alarm_complete_configure (skeleton, invocation);
}
```

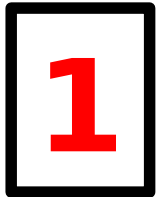
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```
static gboolean
emit_alarm_cb (gpointer skeleton)
{
    alarm_emit_beeeeeeeeep (ALARM (skeleton));
    alarm_set_activated (ALARM (skeleton), FALSE);
    return FALSE;
}
```

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## 5.1. Ejemplo: cliente en JS



```
const InterfaceAlarm = <interface name="es.aleksander.Alarm">
    <signal name="Beeeeeeeeep" />
</interface>;
const ProxyAlarm = Gio.DBusProxy.makeProxyWrapper(InterfaceAlarm);

let proxy = new ProxyAlarm(Gio.DBus.session,
    'es.aleksander.Alarm',
    '/es/aleksander/Alarm');
proxy.connectSignal('Beeeeeeeeep',
    Lang.bind(this, function(proxy, sender_name) {
        print('\n\nBEEEEEEEEEEEEEEEEEEEEEEEEEP!\n\n')
    }));

Mainloop.run();
```

## 5.2. Ejemplo: cliente en Python

```
connection = Gio.bus_get_sync(Gio.BusType.SESSION, None)
proxy = Gio.DBusProxy.new_sync(connection,
                                Gio.DBusProxyFlags.NONE,
                                None,
                                "es.aleksander.Alarm",
                                "/es/aleksander/Alarm",
                                "es.aleksander.Alarm",
                                None)

try:
    proxy.call_sync("Configure",
                   GLib.Variant("(u)", (10,)),
                   Gio.DBusCallFlags.NONE,
                   -1,
                   None)
except Exception as e:
    sys.stderr.write("Error: %s\n" % str(e))
```



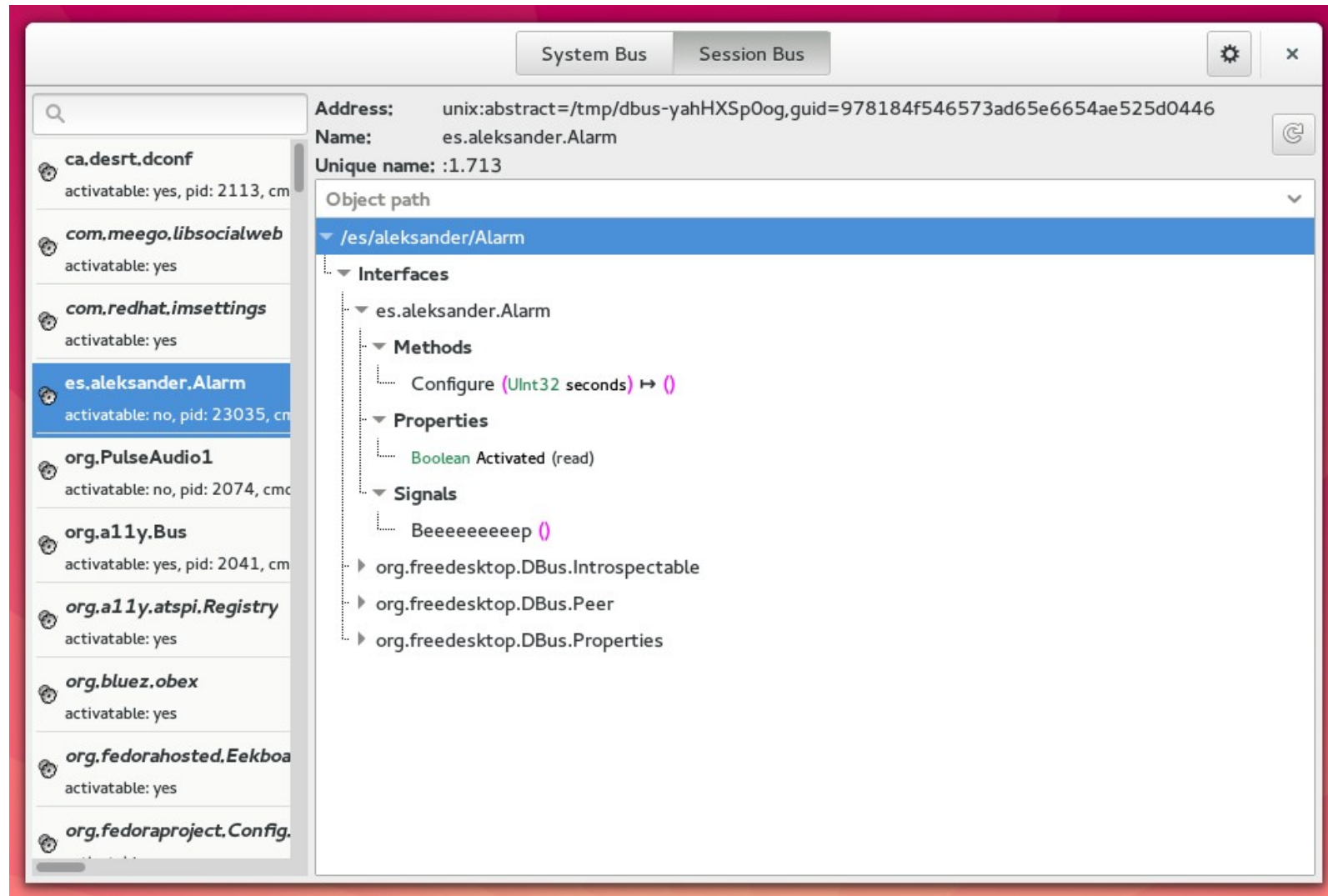
## 6.1. Herramientas: dbus-send

```
dbus-send \  
  --session \  
  --print-reply \  
  --dest=es.aleksander.Alarm \  
  /es/aleksander/Alarm \  
  es.aleksander.Alarm.Configure \  
  uint32:10
```

## 6.2. Herramientas: dbus-monitor

- Monitoriza todos los mensajes que pasan por el bus
  - `dbus-monitor --session`
  - `dbus-monitor --system`

## 6.3. Herramientas: d-feet





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