

D-BUS Is Also Called IPC

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Abstract—The D- BUS is indeed an INTER -PROCESS-COMMUNICATION(IPC) system allow application to communicate with each other on the same mechanism. it provides a standard way for application to exchange the data and signals facilitating communication through a user – defined protocol and API. D-BUS is a part of the free desktop.org project and is used in various application including desktop notification and media player control. D-BUS message includes method calls; method return and signals. And objects on the bus are identified by unique paths and interfaces although D-BUS is a heavily tied to UNIX environments. the protocol itself can be implemented on the other platforms. D-BUS is not exclusively an UNIX only technology theory. but in practice. it is designed for an optimized for UNIX like system it is authentication, socket communication and many API features assume a UNIX environment and attempt to use it on WINDOWS or other NON-UNIX platforms will encounter significant limitation for CROSS-PLATFORMS IPC others mechanism may be more suitable.

Index Terms—API, CORBA, DCOP, GNOME, KDE

I. INTRODUCTION

D-BUS is a inter – process- communication systems (IPC) mechanism initially designs to replace the software components communicate system CORBA and DCOP used by the GNOME and KDE Linux desktop environment respectively the components of environments are normally distributed in many processes each providing only one or a few services. this service may be used by regular client application or by others component of other desktop environments to perform their task.

D-BUS provide a software – bus abstraction that gather all the communication among a group of process over a signal shared virtual channel process connected to a bus do not know. it is internally implemented. but this D-Bus specification grantees that all process connected to the bus can communicate

with each other through it. D-BUS incurs at least a 2.5X performance loss over one-to-one IPC.

D-BUS additional or specification existing functionality to the application including information-sharing , modularity and privilege separation. D-BUS can also be used as a frame works to integrate different components of an user application for instants of an office suit can communicate through the session bus to share between a word process and a spread sheet, for example an information in coming while call returning through blue tooth or skype can be propagated and interpreted by any currently running music player until the call is finished.

II. BUS MEANS IN COMPUTER:

A computer bus is a communication system that transfer data, address and control signals between components with in a computer or between the components .in computing a bus is a shared communication path way that allows multiple hardware components to exchange the information efficiently. it consists of physical connection such as wires, circuit are cables and may also include software protocols to manage data transfer the bus reduce the number of individual connections needed by centralized communication over a single channel similarly to a “DATA HIGH WAY”.it enables components like the CPU, MEMORY, INPUT and OUPUT devices expansion count to interact seamlessly.

III. TYPES OF BUSES

DATA BUS- transfer the actual data between the components such as a from the CPU to memory or input/output devices.

ADDRESS BUS- Carries the memory address specifying when the data should be read from or write to. it specifically unidirectional.

CONTROL BUS- send the control signals to coordinate operation such as read/write commands and timing signals

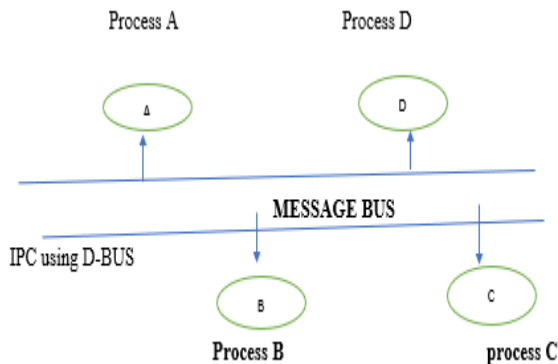
SYSTEM BUS and EXPANSION BUS- system bus connect core components like CPU and memory. which expansion bus (eg PCI, USB) connect to additional peripherals.

IV. CHARECTERSTICS

A bus can be parallel (multiple bit transmitted simultaneously) or serial (bit transmitted sequentially) its width refers to the number of bits it can carry at once and speed determine by its frequency which together defer the data transfer rate. modern bus may also support (direct memory buses) DMA allowing devices to transfer data directly to memory without CPU, intervention improving efficiency.

A computer bus is a critical infra structure that enable efficient communication and coordinate among a computer hardware component supporting both internal and external data transfer.

V. D-BUS MEANS:



In the complex eco-system of Linux inter-process-communication (IPC) is a crucial aspects D-BUS which stands for desktop bus is a message bus system that enable application to communicate with each other's .it provide a simple and efficient way for different process in a Linux system to exchange the data and signals changed for desktop environments. D-Bus has evolved to became a fundamental part of

many Linux system powering everything from system service to user level application this blog post aim to D-BUS including its fundamental correct usage method, common practice.

MESSAGE BUS: at this core of D-BUS is the message bus. there are two main types of message buses in Linux system.

- System bus
- Session bus

The **SYSTEM BUS** is used to communicate between system-level service. such as networks messenger and power manager service.

The **SESSION BUS** another hand is used for communication between application with in user session.

NAMES OF D-BUSES:

Every process on the D-BUSES has a unique name. there are two type of names

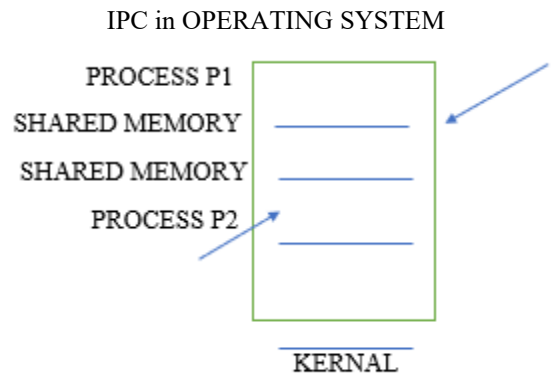
1. Well-known name
2. Unique name

The **WELL-KNOWN** name are human readable names that are used to identify the service.

The **UNIQUE** name are automatically assigned by the bus and are used to identify individual connections.

VI. INTER-PROCESS-COMMUNICATION (IPC) SYSTEMS:

the IPC means sharing the data between running process in a computer system or between multiple such system mechanism for IPC may be provide by an operating system application which use IPC are often categories as client and server where the client - request data and server repones to client-request many application are both client and server.



The IPC is a mechanism that allow the exchange of data between process. it enables resource and data sharing between the process without interference. the communication involve are process inferring another that and even has occurred or that save data has been transferred between process.

VII. IN OPERATING SYSTEM (IPC)

IPC either provided by the inter process control mechanism or handle by the communication processes.

VIII. SEMAPHORE

A semaphore is a variable that control the access to common resources by multiple process. there are two types;

1. Binary semaphore
2. Counting semaphore.

IX. MUTUAL EXCLUSION

Mutual exclusion required that only are process thread can enter the critical section at a time this is useful for synchronization and also race condition.

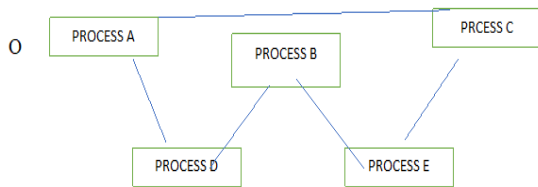
X. BARRIERS

A barrier does no allow individual process to proceed until all the process reach it many parallel language and collective routine impose barriers.

XI. SPIN LOCK

It is type of lock the process type to acquiring lock wait I a loop which checking if the lock is available are not. This known as busy waiting because the process is not doing any useful operation even though it is active.

XII. RELATION BETWEEN D-BUS & IPC: WITHOUT D-BUS

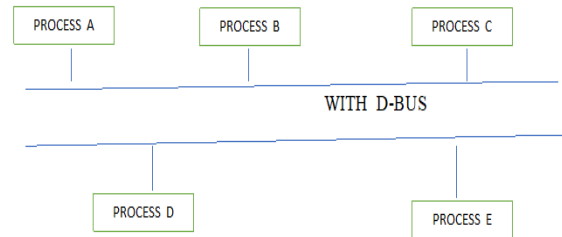


D-BUS is an IPC mechanism initially desired to replace the software components system. CORBA (common request broker agency) and DCOP (distributed constrain optimization) used by the GNOME (GNU network object model environment) and KDE (K desktop environment)- LINUX desktop environment respectively.

The component of desk top environment are normally distributed in memory process each providing only one of a few services may be used by regular client-application or by the components of the desktop environment to perform their task.

Large group of cooperate process daemon a dense mesh of individual communication channels (using ONE-TO-ONE IPC methods) between them. D-BUS simplified the IPC requirements with one single shared channel.

XIII. ARCHITECTURE WITH D-BUS



XIV. CONCLUSION

The D-BUS (desktop bus) is an inter-process-communication system (IPC) that facilitate communication between multi process running on the same or different systems. it is wildly used in LINUX environment to enable seamless interaction between application service and system components the D-BUS operate on client-server technology when the message bus DAEMON act as the server and application act as a client. The D-BUS commonly used to interact with system service like network manager or power management. D-BUS is a powerful IPC mechanism that simplifies communication between LINUX application and system components by leveraging its feature developer can build robust events – driven application that integrated seamlessly in to LINUX ENVIRONMENTS and attempt use it an windows or other NON-UNIX platforms will encounter significant limitation for CROSS-

PLATFORMS IPC others mechanism may also more suitable for communication.

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