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Improving the Deferral Enactment of Vibrant Backpressure Systems

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Abstract:

The backpressure algorithm for dynamic network resource allocation achieves throughput optimality by making use of one hop queue length differences. This elegant algorithm, on the other hand, does not yield good delay performance in general. We introduce a new class of enhanced dynamic backpressure algorithms which make use of a general queue-dependent bias function to exploit queue state information beyond one hop. We prove the throughput optimality of the enhanced algorithms. We further elaborate on two specific algorithms within this class, which have demonstrably improved delay performance while maintaining acceptable implementation complexity.

Keywords — - -

1.INTRODUCTION:

The System Development Lifecycle framework is designed to outline a complete development and implementation process suitable for developing complex applications. SDLC is a process followed for a software project, within a software organization. It consists of a detailed plan describing how to develop, maintain, replace and alter or enhance specific software. The life cycle defines a methodology for improving the quality of software and the overall development process. Business – legislation regulatory requirements, policy, SOP's, guidelines etc. Process – how the business is implemented Data – the core business data elements collected for the business Application – the gate to the business collecting Infrastructure- the servers, network, workstations, etc.

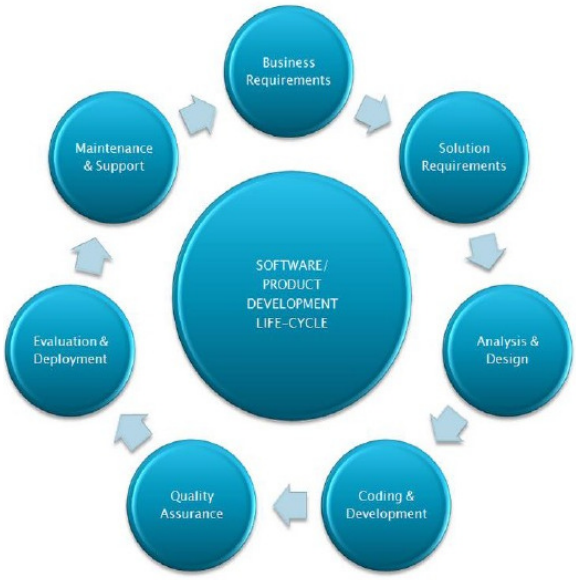
1.1SCOPE OF THE PROJECT

In queuing theory, a discipline within the mathematical theory of probability, the backpressure routing algorithm is a method for directing traffic around a queuing network that achieves maximum network throughput, which is established using concepts of Lyapunov drift. Backpressure routing considers the situation where each job can visit multiple service nodes in the network. It is an extension of max-weight

scheduling where rather each job visits only a single service node.

2 PROBLEMS IN EXISTING SYSTEM

The myopic nature of the DBP algorithm, delay optimal control obtained by dynamic programming makes use of the global queue state information (QSI) via the cost-to-go function.



Hence, a natural approach for improving the delay performance of the DBP algorithm is to intelligently use QSI beyond one hop. The challenge lies in incorporating multihop QSI in a tractable manner so as to preserve the desirable qualities of the DBP algorithm (e.g., throughput optimality) while avoiding the prohibitively high complexity associated with brute-force solutions by dynamic programming.

2.1ADVANTAGES

- Combining computational complexity with signaling overhead
- Higher order of implementation complexity than the traditional algorithm. Lower order of implementation complexity than the DBPSP algorithm.

2.2DISADVANTAGES

It takes lot of time to search and to reach the user. The DBP algorithm is throughput optimal for multi-hop networks under fairly general conditions.

Stage 1: Scheduling and Requisite investigation:

Requirement analysis is the most important and fundamental stage in SDLC. It is performed by the senior members of the team with inputs from the customer, the sales department, market surveys and domain experts in the industry. This information is then used to plan the basic project approach and to conduct product feasibility study in the economical, operational, and technical areas. Planning for the quality assurance requirements and identification of the risks associated with the project is also done in the planning stage. The outcome of the technical feasibility study is to define the various technical

approaches that can be followed to implement the project successfully with minimum risks.

Stage 2: Significant necessities:

Once the requirement analysis is done the next step is to clearly define and document the product requirements and get them approved from the customer or the market analysts. This is done through SRS Software Requirement Specification document which consists of all the product requirements to be designed and developed during the project life cycle.

Stage 3: Scheming the product design:

SRS is the reference for product architects to come out with the best architecture for the product to be developed. Based on the requirements specified in SRS, usually more than one design approach for the product architecture is proposed and documented in a DDS - Design Document Specification. This DDS is reviewed by all the important stakeholders and based on various parameters as risk assessment, product robustness, design modularity , budget and time constraints , the best design approach is selected for the product.

Stage 4: Structure or Mounting the Product:

In this stage of SDLC the actual development starts and the product is built. The programming code is generated as per DDS during this stage. If the design is performed in a detailed and organized manner, code generation can be accomplished without much hassle. Developers have to follow the coding guidelines defined by their organization and programming tools like compilers, interpreters, debuggers etc. are used to generate the code. Different high level programming languages such as C, C++, Pascal, Java, and PHP are used for coding.

Stage 5: Testing the Product:

This stage is usually a subset of all the stages as in the modern SDLC models, the testing activities are mostly involved in all the stages of SDLC. However this stage refers to the testing only stage of the product where products defects are reported, tracked, fixed and retested, until the product reaches the quality standards defined in the SRS.

Stage 6: Consumption in the Market and safeguarding:

Once the product is tested and ready to be deployed it is released formally in the appropriate market. Sometime product deployment happens in stages as per the organizations. Business strategy. The product may first be released in a limited segment and tested in the real business

environment (UAT- User acceptance testing). The product may be released as it is or with suggested enhancements in the targeting market segment. After the product is released in the market, its maintenance is done for the existing customer base.

3 PLATFORM KNOWLEDGE

JAVA (FRONT-END)

3.1OVERVIEW

The Java platform allows software developers to write program code in other languages than the Java programming language which still runs on the Java virtual machine. The Java platform is usually associated with the Java virtual machine and the Java core libraries. It is a Java platform designed for embedded systems (mobile devices are one kind of Such systems). Target devices range from industrial controls to mobile phones (especially feature phones) and set-top boxes. Java ME was formerly known as Java2

3.2WINDOW APPLICATION

Java Platform, Standard Edition or Java SE is a widely used platform for development and deployment of portable applications for desktop and server environments. Java SE uses object-oriented Java programming language Java SE is a platform specification. It defines a wide range of general purpose APIs such as Java APIs for the Java Class Library and also includes the Java Language Specification and the Java Virtual Machine Specification.

3.3 WEB APPLICATION

Java Platform, Enterprise Edition or Java EE Servlet & JSP are Web-server technologies. We use ajdbc program in the web server and access the database & send the result to the user's browser. It is also very useful to be able to send email through the server. JSP is a technology which tries to separate the code from the presentation. If Distributed Objects are not involved, the Servlet/jsp does the processing in web server itself and sends the result to the browser.

INTRODUCTION–NETWORK COMMUNICATION

A computer network or data network is a telecommunications network which allows nodes to share resources. In computer networks, networked computing devices exchange data with each other using a data link. The connections between nodes are established using either cable media or wireless media. The best-known computer network is the Internet. Network computer devices that originate, route and terminate the data are called network nodes. Nodes can include hosts such as personal

computers, phones, servers as well as networking hardware. Two such devices can be said to be networked together when one device is able to exchange information with the other device, whether or not they have a direct connection to each other. Computer networks differ in the transmission medium used to carry their signals, communications protocols to organize network traffic, the network's size, topology and organizational intent.

USES OF NETWORKS

A collection of computers and other devices that are connected together by communication channels for sharing information and resources is called computer network. The resources may include printers, scanners, and hard disks etc. Computer network is also called the information network. The most popular information network is the Internet. In a computer network, two important technologies: computing and telecommunication work together. Create new apps and The main benefits or uses of computer network are:

1. Communication
2. Sharing Resources
3. Sharing Software
4. Data Sharing

1- Communication

Using a network, different people can communicate with each other all over the world. People can communicate at very low cost via e-mail, chatting, telephone, video telephone, video conferencing, groupware, and SMS services etc.

2- Sharing Resources

In a computer network, resources such as, printers, scanners, fax machines and modems can be shared among different users. Suppose several personals computers and a laser printer are connected to a network. Each users can access the printer.

3- Sharing Software

In a computer network, usually application programs and other software are stored on the central computer. Users connected to a network can access these programs or software.

4- Data Sharing

In a network environment, any authorized user can access data stored on other computers on the network. For example, on the Internet, a large number of Internet users can access same database.

TYPES OF NETWORK:

There are many ways in which different networks can be classified, such as their size, capabilities and the geographical

distance they cover. A network is simply a group of two or more computer systems linked together in some way so that they can share data between them. Different types of networks provide different services, and require different things to work properly. Most network types are known as different types of 'area' networks – this is due to the history of networks, and dates back to the time when computer networks were defined by their literal scale. This is no longer always the case due to new technology. Some of the most common types of network you are likely to encounter are detailed here below:

Local Area Network (LAN)

This is one of the original categories of network, and one of the simplest. LAN networks connect computers together over relatively small distances, such as within a single building or within a small group of buildings.

Wide Area Network (WAN)

This is another of the original categories of network, and slightly more complex in nature. WAN networks connect computers together over large physical distances, remotely connecting them over one huge network and allowing them to communicate even when far apart. The Internet is a WAN, and connects computers all around the world together.

Metropolitan Area Network (MAN)

This is a network which is larger than a LAN but smaller than a WAN, and incorporates elements of both. It typically spans a town or city and is owned by a single person or company, such as a local council or a large company.

Campus Area Network

This is a network which is larger than a LAN, but smaller than an MAN. This is typical in areas such as a university, large school or small business. It is typically spread over a collection of buildings which are reasonably local to each other. It may have an internal Ethernet as well as capability of connecting to the internet.

Network Characteristics

1. Topology

The geometric arrangement of a computer system. Common topologies include a bus, star, and ring. See the Network topology diagrams in the Quick Reference section of Webopedia.

2. Protocol

The protocol defines a common set of rules and signals that computers on the network use to communicate. One of the most popular protocols for LANs is called

Ethernet. Another popular LAN protocol for PCs is the IBM token-ring network.

3. Architecture

Networks can be broadly classified as using either a peer-to-peer or client/server architecture. Computers on a network are sometimes called nodes. Computers and devices that allocate resources for a network are called servers.

Topology in Network Design

Think of a topology as a network's virtual shape or structure. This shape does not necessarily correspond to the actual physical layout of the devices on the network. For example, the computers on a home network may be arranged in a circle in a family room, but it would be highly unlikely to find a ring topology there. Network topologies are categorized into the following basic types:

i.Bus

ii.Ring

iii.Star

iv.Tree

Mesh

Bus Topology

Bus networks (not to be confused with the system bus of a computer) use a common backbone to connect all devices. A single cable, the backbone functions as a shared communication medium that devices attach or tap into with an interface connector. A device wanting to communicate with another device on the network sends a broadcast message onto the wire that all other devices see, but only the intended recipient actually accepts and processes the message.

Ring Topology

In a ring network, every device has exactly two neighbors for communication purposes. All messages travel through a ring in the same direction (either "clockwise" or "counterclockwise"). A failure in any cable or device breaks the loop and can take down the entire network. To implement a ring network, one typically uses FDDI, SONET, or Token Ring technology. Ring topologies are found in some office buildings or school campuses.

Star Topology

Many home networks use the star topology. A star network features a central connection point called a "hub node" that may be a network hub, switch or router. Devices typically connect to the hub with Unshielded Twisted Pair (UTP) Ethernet.

Tree Topology

A tree topology joins multiple star topologies together onto a bus. In its

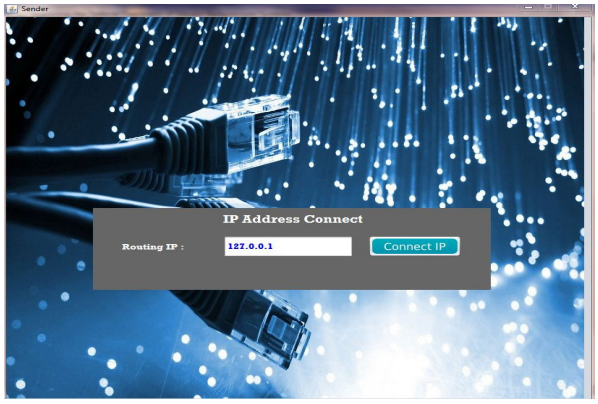
simplest form, only hub devices connect directly to the tree bus, and each hub functions as the root of a tree of devices. This bus/star hybrid approach supports future expansion of the network much better than a bus (limited in the number of devices due to the broadcast traffic it generates) or a star (limited by the number of hub connection points) alone.

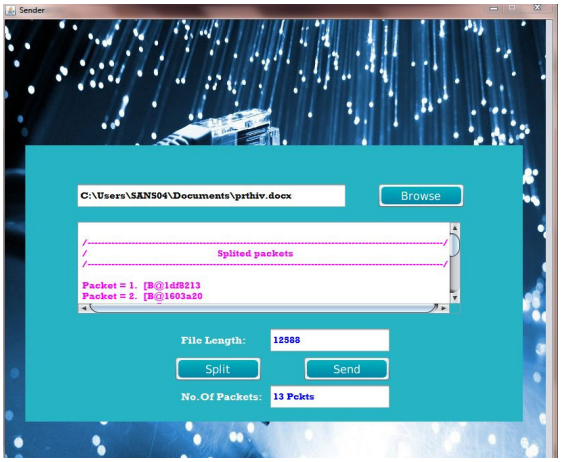
Mesh Topology

Mesh topology introduces the concept of routes. Unlike each of the previous topologies, messages sent on a mesh network can take any of several possible paths from source to destination. (Recall that even in a ring, although two cable paths exist, messages can only travel in one direction.) Some WANs, most notably the Internet, employ mesh routing**.**

4.Output screenshots

Screenshot 1





Screen shot 2

Screenshot 3

5. CONCLUSION:

In this paper, we proposed a new virtual queue-based back-pressure scheduling algorithm VBR, which pre-establishes gradient at each node in a WSN and integrates this gradient when calculating the queue backlog differential between neighboring nodes when making back-pressure-based scheduling decision. We proved

the throughput optimality of VBR. Simulation results show that VBR can significantly improve network performance in terms of packet delivery ratio, average E2E delay, and average queue length at each node as compared with existing work.

6. .FUTURE ENHANCEMENT:

In future,we expect combining computational complexity with signal-ing overhead, we see that the DBPmin algorithm has a higher order of implementation complexity than the traditional DBP algorithm, the DBPbias algorithm and the DBPnxt algorithm, but lower order of implementation complexity than the DBPSP algorithm.

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