

A Trust Model Of Cloud Scheduling Based On Data Integrity Using Ant Lion Optimizer

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Abstract

In The Internet, A Number Of Services Have Become Flexible And Cost-Effective Because Of Cloud Computing. Security Is The Major Hitch In Cloud Computing And Many Researchers Have Studied And Discussed The Problems Relating To This Issue. Various Techniques Are Requiring Ensuring The Integrity Of Data Which Is The Integral Part Of Cloud Storage Adoption. Five Different Trust Attributes Are Collected From Third Party And Its Trust Model In This Work And Integrity Of Data Are Assured Through The Servers. Ant Lion Optimizer (Alo) Algorithm Uses Optimal Scheduling, Which Is Proposed And Contrasted With Particle Swarm Optimization (Pso).

Keywords: Cloud Computing, Data Integrity, Third Party Trust Model, Particle Swarm Optimization (Pso) And Ant Lion Optimizer (Alo) Algorithm.

1. Introduction

Cloud Computing Is The Core Technical Topic Found In This Century, Which Has Been Emerging With A Wide Range Of Effects Across Data Storage, Businesses, Software Engineering And It [1]. Technique Of Virtualization Will Be Implemented By Cloud Computing To Provide The Resources In Effective Manner To The End User. The Features Of Cloud Computing Includes Availability, Scalability And Manageability. In Addition, Cloud Computing Has Been Found To Cost Effective, Fast, Stable Flexible, Multitenant, Ubiquitous And On-Demand Service. Three Models Of Service Delivery Have Been Offered Namely: The Infrastructure As A Service (IaaS), The Platform As A Service (PaaS) And The Software As A Service (SaaS) [2]. Four Prototypes Have Been Developed By The Nist In The Cloud Which Are The Public, The Private, The Hybrid And The Community. A Cloud Server Stack Is Used By Cloud Computing Where In The Front-End A User Is Found While The Server Is Located At The Backend.

Scheduling In Cloud Is The Vital Hurdle In Cloud Computing Which Can Allocate Tasks To Best Existing Resources Depends On Task Priorities, Metrics And Requisites Without Disturbing The Services Offered By The Cloud. Allocation Of Resources Is Decided By Scheduling In Cloud Computing Like Cpu, Memory, Secondary Storage Unit I/O, Network Bandwidth And So On Between Tasks And Users. Scheduling Approach Is Implemented By A Good Scheduler Depend On Varying Scenario Over A Period Of Time, With The Nature And Its Benchmarks Of Tasks Involved In Group Of Tasks Given In For Its Processing [3].

For The Purpose Of Volatile Data, Various Integrity Schemes Are Identified, Which Are Found To Be Out Of Scope Of Its Survey. The Three Objects Identified In This Data Integrity Method Include (I) The Owner Subcontracting Data, (Ii) The Cloud Storage Provider (Csp) For Whom This Data Has Been Outsourced. The Auditor Can Act As The Owner And Ascertain The Responsibility To A Third Party Auditor (Tpa). With Regards To The Data Integrity Protocol, There Are Two Different Stages:

1. The Pre-Processing Phase: Here There Is Pre-Processing Of Data And Generation Of Some Other Data. After This Process, Both Metadata And Data Are Outsourced Judiciously To Its Csp.
2. The Verification Phase: A Demand Of Appeal Will Be Sent By The Auditor To Csp Which Will Create A Proof For Possession, Which Will Make Use Of Data And Metadata That Have Provided To An Auditory. After This Process, A Proof Will Be Verified By The Auditor Assuring That The Data And Its Integrity Are Intact.

Any Data Manipulation Can Be Recognizing By The Usage Of Data Integrity Approaches And For The Purpose Of Data Recovery All Necessary Measures Are Used. To Ensure A Good Comprehension Of The Data Schemes, A Thematic Classification Is Defined With Its Basis On Nature Of Data That Is Dealt With The Capacity Will Be Used By Metadata And Deployment Scenarios Utilized By Implementation Primitives [4].

A Crucial Problem Today Is Security In Case Of An Environment Of Cloud Computing. There Are Certain Unique Features Embedded In The Systems For Security. An Advancement Of This Embedded System Attributes To The Enhanced Tools That Work With Them. An Easy Way In Debugging The Embedded Devices Is To Connect This To The Local Network. The Ubiquitous Computing Is Connected With An Embedded System. Virtualization Causes All Primary Problems In Security In Cloud Computation Within Embedded Systems.

Hotspot Research Area In Cloud Is Resource Scheduling Because Of Its Increased Execution Time And Cost. Together With Its Attributes, There Is A Different Criterion Of Resource Scheduling Which Are Directed Towards A Number Of Categories In Resource Scheduling Algorithms (Rsas). Identification Of Suitable Resources Is The First Objective To Schedule Suitable Workloads And Increasing The Effectiveness Of Resource Utilization. Best Mapping Of Resource Workload Is Required For Better Scheduling. Another Aim Of Resource Scheduling Is Identification Of Appropriate Workload That Supports A Number Of Workloads That Can Fulfil Various Qos Requisites Like Cpu Usage, Availability, Reliability And Security For Cloud Work Overload [5]. Thus, Time Taken Is Considered By Resource Scheduling For The Execution For Each Workload And The Basis For Overall Performance On Workload Type Together With Various Requisites Of Qos (Heterogeneous Workloads) With Similar Qos Needs (Homogenous Workloads) [6].

A Trust Is Maintained Between Various Entities With Regards To Connection With Integrity, Reliability Dependability And Security. Trust Property Is The Primary Trust Model For Resource Scheduling In Cloud Which Is Identified As Resources Between The Jobs. This Is Required For Safety And Reliability Which Again Is Dependent On Users.

Another Scheme Is Present Which Is Not Involved In Any Encryption Of The Proposed Data. Only Certain Bits Of Data Are Encrypted For Its Data Block And The Overhead Computation Of The Client Is Reduced And So This Is Suitable For Thin Clients. For Integrity Of Data Through The Proposed Technique, The Verifier Should Store A Cryptographic Key Without Considering The Data File F And Its Size And Also The Functions Which Can Produce A Random Sequence, Where The Verifier Does Not Store Any [7]. There Is Due Pre-Processing Of The File And Metadata Is Appended Before Being Stored In The Archive. The Verifier Uses It While Verifying The Metadata For Integrity Verification. It Is Quite Important To Verify If The Data Integrity Protocol Has Been Altered Or Remove Illegally.

If The Pso Has Its Basis On Intelligence, Then It Will Not Have Mutation, Calculation Or Overlapping. The Search Depends On The Particle's Speed. During The Development Of A Number Of Generations, Information On Particles Will Be Transmitted By Optimist Particles And The Speed Of Research Is Fast. There Are Certain Drawbacks In Pso, In Spite Of Its Advantages: Pso Technique Will Suffer From Some Partial Optimism Which Lowers Speed Regulation. This Technique Cannot Work On Cost And Comparison Might Become Challenging. This Is The Reason Why Ant Lion Optimizer Has Been Proposed To Solve Pso Based Problems. This Is A Nature-Inspired Technique Which Imitates Ant Lions And Their Hunting Behaviour. This Algorithm Outputs Great Results For Different Mathematical Functions, The Issues In Engineering And The Restriction In The Real Problems. Better Results Are Also Provided By Improved Search Space Exploration, Avoiding Local Optima And Better Rate Of Convergence [8].

A Trust-Based Integrity Of Data Together With Pso Is Proposed In This Work And For Scheduling Ant Lion Algorithm Is Used. The Remainder Of The Study Finds Its Organization As Follows: Review Of Literature Is Placed In Section 2; Methodology Followed Is Explained In Section 3; Results Are Discussed In Section 4 And Conclusion Is Incorporated In Section 5.

2. Literature Survey

Management Of Resources Was Analysed By Singh And Chana [9]. For This Purpose, 110 Research Papers Were Analysed Among A Collection Of 1206 Published In About 19 Workshops, Symposiums Conferences And About 11 Famous Journals. An In Depth Analysis Was Conducted On Resource Scheduling Based Cloud Computing With A Number Of Types And Benefits Of The Tools, 13 Types Of Algorithms Were Connected Through Literature In Resource Scheduling And Eight Other Types Of Policies On Resource Distribution. For A Particular Type Of Workload, Another Methodical Analysis Of Research Which Helped Researchers Was Chosen. This Study Suggested The Directions That Have To Be Given In The Future.

Security Issue Was Studied By Zafar Et Al., [10] Whose Aim Was Understand Cloud Storage Security And The Criticality Of Schemes Of Data Integrity Was Highlighted. A Comparison On Analysis Of Schemes And Detailed Discussion On Security Attacks And Their Mitigations Were Conducted. In Addition, Design Issues Including Reduced I/O, Efficiency Of Communication, Storage And Computation Was Included. Moreover, It Highlights Future Trends And Open Issues In Upcoming Research.

The Customer's Ability To Check On The Accuracy Of Cloud Data Was Studied By Deore Et Al [7]. A Compromise Was Reached Between The Cloud And Customer, Which Was Incorporated Within Service Level Agreement (Sla) Ensuring The Client Storage Is Minimal And Maybe Advantageous For Thin Clients.

Another New Prototype Based On Trust Was Formulated By Manuel [11] With Advantages Of The Past And Capacities Of The Present Provider Of Cloud Services. Four Various Attributes Were Used For Trust Value Which Includes Reliability, Availability, Turnaround Efficiency And Data Integrity. This Is Implemented Through A System Of Trust Management. There Is Further Description On The Paper In Which A Service Level Agreement Is Prepared By Combining The Requisites Of Qos And Capacities Of Provider Of Cloud Service. The Fact With The Fulfilment Of The Prototype Is A Good Contrast To The First One And Other Similar Ones Were Demonstrated In This Study.

Another New Task-Scheduling Algorithm In Cloud Computing Was Proposed By Almezeini And Hafez [12] With Its Basis On Lion Optimization Algorithm. This Is Again A Population-Based Nature-Inspired Algorithm Which Was Proposed By Maziar Yazdani And Fariborz Jolai In The Year 2015. This Is A Meta-Heuristic Which Takes Its Inspiration On The Lifestyle Of Lions And Their Characteristics. This Has Been Compared With Other Scheduling Algorithms Such As Ga And Pso And The Results Were Better Compared To Similar Algorithms.

3. Methodology

There Is A Compromise Between Cost And Task Execution Time Through Many Scheduling Algorithms. In Such Cases The Assumption Is That All Cloud Services Are Trustworthy, While In Reality Some Are Dishonest And Malicious. If There Is Mistrust In Cloud Environment, Then There Is Uncertain Scheduling. Uncertainty Is Minimized By Trust While Developing A Model To Measure Among The Computing Nodes Of Open Distributed System Such As Grid And Cloud Environments. Trustworthiness And Reliability In A Schedule Are Improved By The Use Of Trust In Scheduling [13].

Smallest Task Is Selected By The Min-Min Scheduling From All Existing Tasks And Is Assigned To A Resource That Gives The Minimum Completion Time (Fastest Machine) For The Task. Total Finished Time Of All Tasks Is Increased And Increases The Makespan But Load Of Machines Is Not Considered Before Scheduling As Smallest Tasks Are Assigned On Faster Machines. In This Point, Expected Finished And Execution Time For A Task Are Almost Similar Values Or Nearest Values. The Larger Tasks Have More Waiting Time To Complete The Execution Of Smallest Ones But The System's Overall Productivity Is Improved [14].

Max-Min And Min-Min Are Similar But For That A Longest Task Is Chosen (With Maximum Completion Time) In Scheduling The Available Best Machine On The Basis Of Minimum Finishing

Time Of The Specific Task On All Available Machines. Here Load Balancing Is Not Considered Where Smaller Tasks Have To Be Starved. However, The Makespan Is Increased And System Throughput Than Min-Min Strategy As The Longest Task Determines Makespan Of All Available Tasks In The System. Thus, Faster Machines Can Execute Longer Tasks In Max-Min And Smaller Tasks Executed In Parallel On All The Other Possible Machines Resulting In Better Makespan And Load Balancing Done Than The Earlier.

A Third Party Trust Model Is Explained Further In This Section With Proposed Integrity Of Data With Ant Lion Optimization And Pso In A Detailed Manner.

A Secured Service Will Be Offered By Security Service And One More May Not In Case Of The Latter Charges Half It Price Where Most Organizations Prefer For The Next One Since There Is No Way To Investigate Its Change.

3.1 Third Party Trust Model

Whether A Cloud Provider Can Provide Secure Service Or Not Is Under Dispute And So The General Notion Of The Organizations Is To Opt For The Provider Who Quotes The Lowest Price. The Following Criteria Should Be Checked Before Opting For A Cloud Service Provider.

The Lack Of Latency And The Bandwidth Guarantees: Latency And Bandwidth Guarantee Are Two Features That Have To Be Assured By A Service Provider. Among The Two, The Former Is Based On The Servers And Their Placement Geographically With Content Delivery Network (Cdn) Services.

The Weak Service Level Agreements (Slas): One Of The Challenges Faced By The Consumer While Considering Services Offered By Providers Of Cloud Is The Standard Service Level Agreement (Sla).

Lack Of Interoperability And Standards: Common Open Standards Such As Data Portability Or Vendor Lock-In Are Not Used By Cloud Providers Which Can Lead Customers Into Problems. Moreover, To Accredite These Providers, There Are No Other Body Of Independent Accreditation. Features Of Portability In A Boundary Are Limited, Which Are Provided By Some Such Providers.

Lack Of Customer Support: 24/7 Customer Support Is Being Provided By Providers Such As Rack Space Inc., Go Grid Or Zoho. Paid Customer Support Is Provided By Microsoft Or Amazon. Google's Attitude Is Like "Cloud It On Your Own".

Lack Of Reliability: A Major Concern Of The Consumers [15] Is The Availability Of All Resources With Regards To Cloud Computing.

A Trusted Third Party In A Cloud Environment Is Used In This Paper Which Enables Trust With Cryptography So As To Assure Confidentiality, Integrity And Authenticity. The Faith Of The Customer Is Expressed Through The Trust Notion Against Third Party On A Specific Operational And Ethical Trait Of Quality That Acknowledges A Factor Of Minimum Risk. Ttp Is Supported By The Party Customers Trust For Security Which Will Be Offered In All Transactions.

Authenticity, Integrity And Confidentiality Of Communications Are Preserved By Employing Trusted Third Party Service For Cloud Which Can Employ The Needed Level Of Trust In Providing Ideal Solutions. There Can Be A Ttp For Cases Of Cryptography And This Is An Entity Which Secures All Interactions Within Parties. The Idea Behind This Is That Ttp Should Be Within Information System To Provide End-To-End Security Services. The Guarantee Of A Relation Of Trust Between Two Parties Has Been As A Result Of Certain Specific Mechanism, Techniques And Acceptance. Figure 1 Shows A Data File F Along With 6 Data Blocks

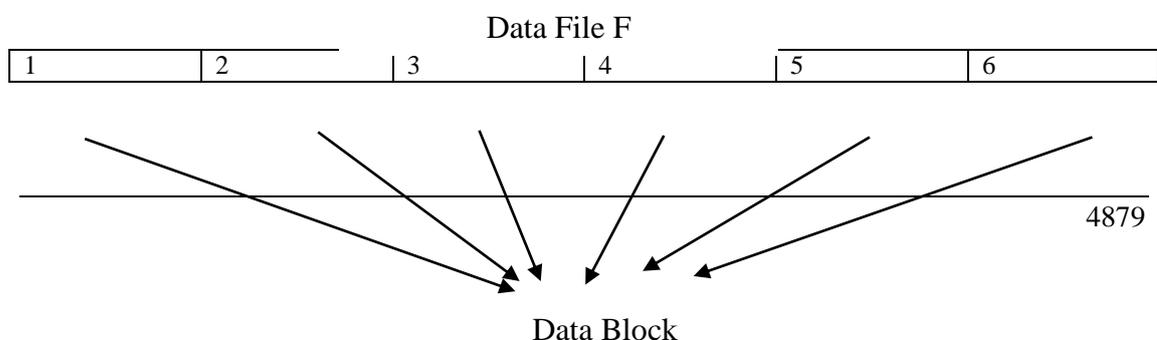


Figure 1 A Data File F With 6 Data Blocks

3.2 Particle Swarm Optimization (Pso)

Kennedy And Eberhart [1995] Proposed Pso Which Is A Significant Innovative Invention Inspired By The Research On The Group Behaviour Of Birds. Stochastic Methods Are Made Use Of By Pso In Order To Generate Feasible Population For Acceleration Of Convergence Speed. Moreover, Individuals Are Shifted To Regions Which Are Better In Accordance With Their Fitness. The Fitness Of Each Of These Particles Are Calculated Through Pso Which Was Iterative. These Particles Are Updated On Their Own Through Tracking Individual Optimal P_i And Also The Global Minimum P_g [16]. This Model For Job Scheduling Is Found In The Cloud: In Case There Are The N_p Particles, Its Particle Search Space Will Be $D=M \times N$, In Which The Actual Amount Of The Jobs Will Be Known As M, The Actual Amount Of Resources Will Be Known As N And The i^{th} Particle's Position $X_i = (X_{i11}, \dots, X_{imn})$, And Also Its Speed $V_i = (V_{i11}, \dots, V_{imn})$. Among These, The $X_{iab} \in \{0,1\}$ Will Now Mean That The i^{th} Particle Has Assigned An A^{th} Job To That Of The B^{th} Resources. Therefore, This i^{th} Particle And Also Its Optimal Position Will Be $P_{iab} = (P_{i11} \dots P_{imn})$. The Actual Optimal Location Of The Global Will Be $P_{gab} = (P_{g11} \dots P_{gmn})$. The Updating Formula's Velocity Is Observed As Per Equation (1):

$$V_{iab}^{new} = \omega V_{iab} + c_1 r_1 (P_{iab} - X_{iab}) + c_2 r_2 (P_{gab} - X_{iab}) \tag{1}$$

Where The ω Denotes Its Final Inertia Weight, r_1, r_2 Denote A Random Number Which Falls Between (0,1), And c_1, c_2 Depict The Learning Factors.

3.3 Ant Lion Optimizer (Alo)

Ant Lions Belong To The Family Of Myrmeleontidae And Are Widely Called Doodlebug During Larval Stages. The Funnel-Form Pits Constructed By Them In The Sand Help In Hunting Insects. During Adulthood, They Use Them For Reproduction. The Larvae Of Ant Lions Dig Pits And Stay Hidden At The Bottom Waiting For Insects. This Intelligent Behaviour Of Ant Lions Will Help Them Motivate To Formulate Another Heuristic Algorithm Which Is Applied To The Problems In Optimization For Various Disciplines. Based On Their Behaviour Ant Lion Optimizer (Alo) Was Proposed And Tested With The Help Of Mathematical Functions Together With Three Other Classical Engineering Problems. During Optimization, Assumptions Were Set With The Help Of The Hunting Behaviour Of Ant Lions.

- The Ants Move Around The Search Space Through A Different And Rand Walk Which Was Influenced By Ant Lion Traps.
- Pits Are Built By Ant Lions In Proportion To Their Fitness Which Would Increase The Chance Of Catching Ants.
- An Ant Lion Catches Every Ant And Is Marked As Elite Ant Lion (Ant Lion Possessing Highest Fitness Value).
- In Case It Has A Higher Fitness, An Ant Is Caught By The Ant Lion.

Considering Alo Algorithm, There Was A Random Movement By Ants Which Are Modelled Through Random Walk Phenomena As Per Equation 2. Another Cumulative Sum Function Was With A Random Function In Equation 3 Is Used To Mimic The Walk Over Other Iterations:

$$A(i) = [0; cumsum(2r(i_1) - 1); cumsum(2r(i_2) - 1); \dots; \dots; cumsum(2r(i_{iter}) - 1)] \tag{2}$$

$$r(\Delta) = \begin{cases} 1, & \text{if rand} > 0.5 \\ 0, & \text{if rand} \leq 0.5 \end{cases} \quad (3)$$

In This, The $A(i)$ Indicated A Random Walk Change For The Ant ‘I’, ‘Iter’ Is The Number Of Actual Iterations, $r(\Delta)$ Denotes A Random Generating Function Wherein The ‘ Δ ’ Dictates The Actual Step Size Of A Random Walk. For Ensuring The Random Walk Of Ants Is Inside A Search Space, There Was ‘Min-Max’ Normalization As Per Equation 4. This Had Been Used For Making Sure That These Ants Continue To Walk Inside Of The Search Space.

$$A_i^t = \frac{(A_i^t - a_i) \cdot (d_i - c_i^t)}{(d_i^t - a_i)} + c_i \quad (4)$$

For This, The A_i^t Indicates The Original Position Of That Of The Ith Ant At The Tth Repetition And a_i Further Represents The Lowest Of The Random Walk Of The Ith Ant, The c_i^t And The d_i^t Had Indicated Both The Lowest, As Well As The Highest Of The Ith Ant At The Tth Iteration Respectively.

Also, The Random Walk Of The Ants Will Now Be Affected By A Trap That Had Been Built By An Ant Lion Within A 2-D Search Space And Its Behaviour Has Been Mathematically Formulated As Per Equation (5).

$$\begin{aligned} c_i^t &= Antlion_j^t + c^t \\ d_i^t &= Antlion_j^t + d^t \end{aligned} \quad (5)$$

In Which The c^t And d^t Duly Represent The ‘Minimum’, As Well As The ‘Maximum’, Of All The Variables At The Iteration-T Respectively, And c_i^t Denotes The ‘Minimum’ And The ‘Maximum’ Of All Different Variables At An Iteration-T For The Ith Ant Respectively And The $Antlion_j^t$ Indicates The Actual Position Of The Chosen Jth Ant Lion At The Iteration-T. The Trap’s Effectiveness Will Decide The Actual Fitness For Every Ant Lion Thus Increasing The Probability Of It Catching A Prey. A Solution That Was Best Was Obtained Using This Principle Of Elitism And Referred As Elite Ant Lion. Roulette Wheel Was Made Use Of By Ant Lion Based On The Ant Position And Any Change To Achieve Optimal One Which Has Been Modelled As Per Equation (6). Due Updating Was Done By The Final Position Of Every Ant By Making Use Of Random Walk To Another Randomly Chosen Ant Lion (Rta) Together With Random Walk Towards An Elite Ant Lion (Rte)

$$Ant_i^t = \frac{R_A^t + R_E^t}{2} \quad (6)$$

For Every Such Ant Lion, An ALO Optimization Algorithm Had Applied The Steps Below:

- **Building Trap** – Roulette Wheel Was Made Use Of By Ant Lion Hunting Behaviour To Choose The One With High Value Of Fitness From Population At The Time Optimization. There Will Be Trapping Of Ants In The One Chosen With Ant Lion.
- **Catching The Prey And Rebuilding The Trap** – The Ant Found In The Bottom Of The Trap Is Consumed By Ant Lion And The Position Is Modified By Building A New Trap To Catch Prey.

When The Fitness Of The Prey Is Highest, The Ant Lion Catches It As Per Equation 7 Where F (Ant) And The F (Ant Lion) Duly Indicate The Actual fitness Value Of Both The Ant And Also The Ant Lion Respectively.

$$Antlion'_j = Ant'_j; \quad \text{if } f(Ant'_j) > f(Antlion'_j) \tag{7}$$

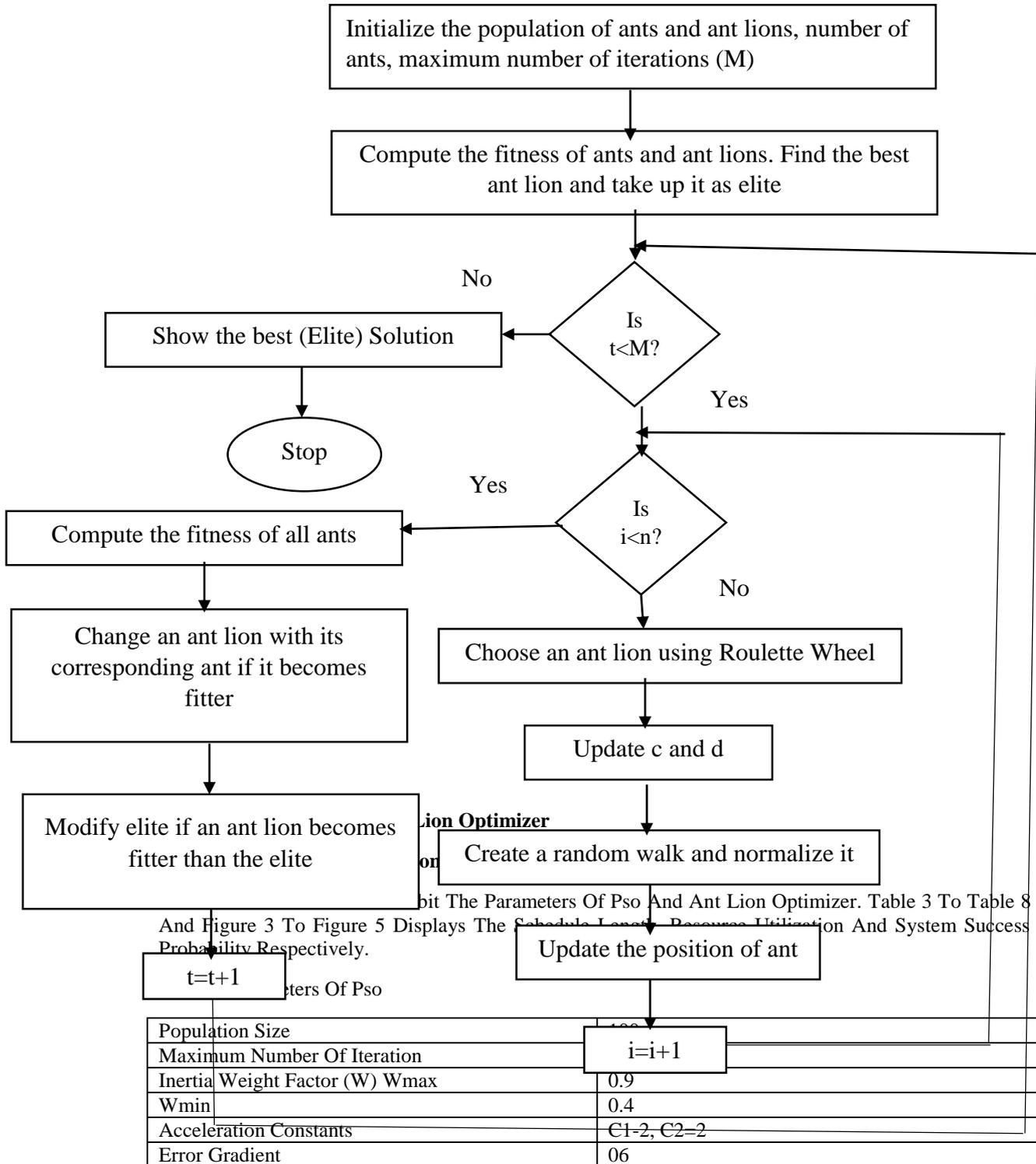


Table 3 To Table 8 And Figure 3 To Figure 5 Displays The Schedule Length, Resource Utilization And System Success Probability Respectively.

t=t+1	
Population Size	100
Maximum Number Of Iteration	100
Inertia Weight Factor (W) Wmax	0.9
Wmin	0.4
Acceleration Constants	C1=2, C2=2
Error Gradient	06

Table 2. Parameters Of Ant Lion Optimizer

Ant Population (N)	15
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Ant Lion Population	15
Maximum Number Of Iteration (M)	300

Table 3. Schedule Length In (Ms)

Number Of Tasks	Pso	Ant Lion Optimizer
300	672	645
600	1462	1397
900	2177	2082
1200	2940	2846
1500	3522	3358

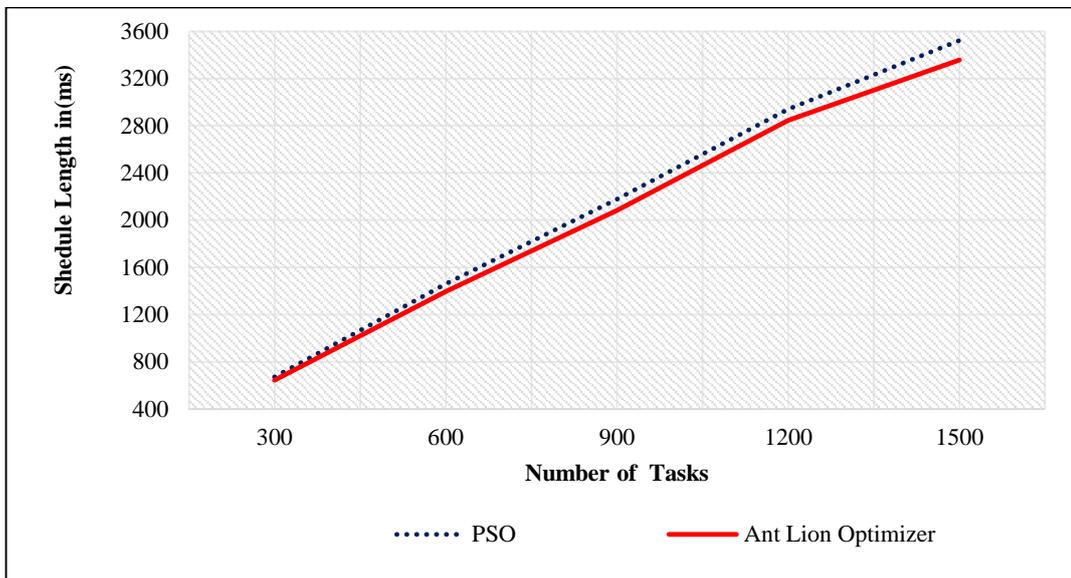


Figure 3. Schedule Length(Ms)

Table 4. Comparative Study Of Alo Algorithm Over Pso Algorithm On The Basis Of Schedule Length:

No Of Tasks	Pso Algorithm (Ms)	Alo Algorithm (Ms)	Alo Algorithm Reduction Over Pso Algorithm
300	672	645	4.01%
600	1462	1397	4.44%
900	2177	2082	4.36%
1200	2940	2846	3.19%
1500	3522	3358	4.65%

From The Results Of The Above Table 4 It Is Observed That The Average Schedule Length In Seconds Of Ant Lion Optimizer Performs Better By Lowering The Schedule Length By 4.01%, By

4.44%, By 4.36%, By 3.19% And By 4.65% For Number Of Jobs 300, 600, 900, 1200 And 1500 Respectively Than Pso.

Table 5. Resource Utilization (%)

Number Of Tasks	Pso	Ant Lion Optimizer
300	89	92
600	88	90
900	92	94
1200	92	94
1500	89	91

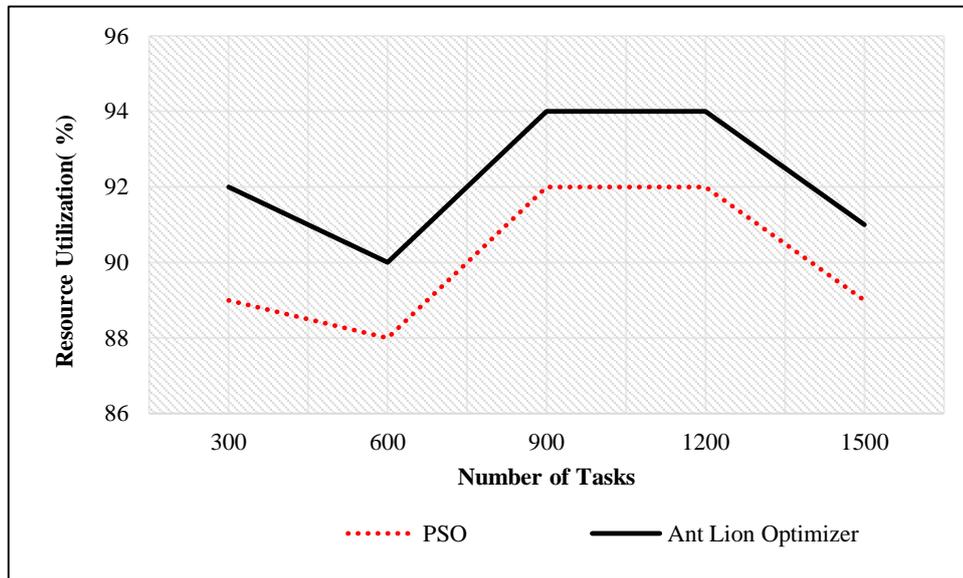


Figure 4. Resource Utilization (%)

Table 6. Comparative Study Of Alo

Algorithm Over Pso Algorithm On The Basis Of Resource Utilization(%)

No Of Tasks	Pso Algorithm (%)	Alo Algorithm (%)	Alo Algorithm Reduction Over Pso Algorithm
300	89	92	3.26%
600	88	90	2.22%
900	92	94	2.12%
1200	92	94	2.12%
1500	89	91	2.19%

From The Results Of Above Table 6 It Is Observed That The Resource Utilization In Seconds Of Ant Lion Optimizer Performs Better By 3.26%, By 2.22%, By 2.12%, By 2.12% And By 2.19% For Number Of Jobs 300, 600, 900, 1200 And 1500 Respectively Than Pso.

Table 7. Success Probability

Number Of Tasks	Pso	Ant Lion Optimizer
300	0.86	0.88

600	0.82	0.84
900	0.78	0.80
1200	0.76	0.78
1500	0.75	0.77

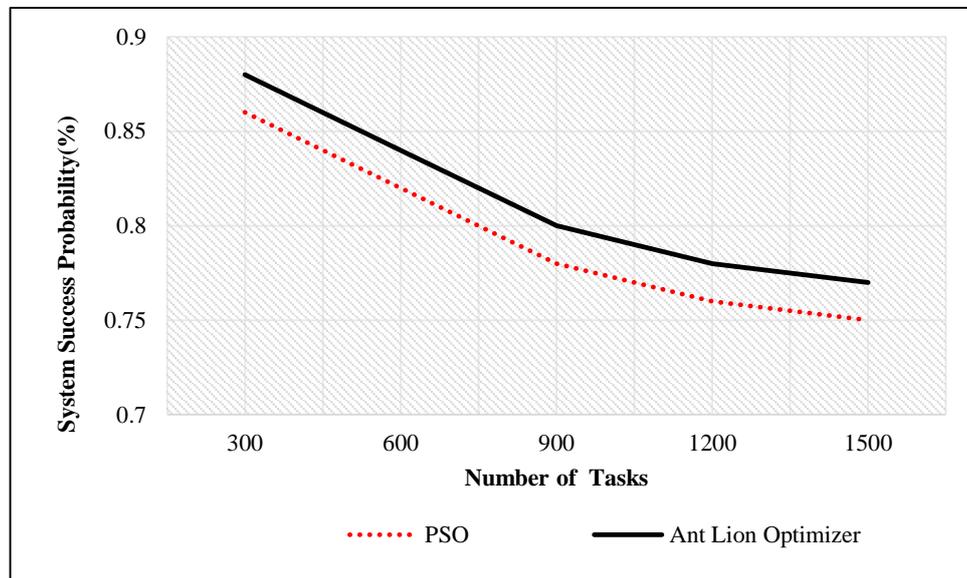


Figure 5 System Success Probability

Table 8. Comparative Study Of Alo Algorithm Over Pso Algorithm On The Basis Of Success Probability:

No Of Tasks	Pso Algorithm (%)	Alo Algorithm (%)	Alo Algorithm Improvement Over Pso Algorithm
300	0.86	0.88	2.27%
600	0.82	0.84	2.38%
900	0.78	0.80	2.50%
1200	0.76	0.78	2.56%
1500	0.75	0.77	2.59%

From The Results Of The Above Table 8 It Is Observed That The System Success Probability In Seconds Of Ant Lion Optimizer Performs Better By 2.27%, By 2.38%, By 2.50%, By 2.56% And By 2.59% For Number Of Jobs 300, 600, 900, 1200 And 1500 Respectively Than Pso.

5. Conclusion

In Cloud Computing The User Makes Use Of Services Which Are Provided By Csp On The Basis Of Pay-Per-Use Method. Significant Role Is Played By The Scheduling Of The User In Improving Performance Of The Cloud Services. This Is An Area Of Research Where The Benefits Are On-Demand, With Rapid Resource, Location, Elasticity, Pay And Use Policy And Independent Resource Pooling. In Terms Of Challenges, The Integrity Of Data Is Critical As It Assures That The Data Is Correct, Unmodified And Of Right Quality. Pso And Antlion Optimizer Has Been Proposed For This Work. Pso Is Communal, Population-Based Global Search Swarm Intelligence Meta-Heuristic. Random Walk Of An Ant Is Created By Alo And Grows Within The Limits Of Ant Lion. The Main Aim Of Tis Algorithm Is In Reducing The Makespan And Total Cost Of Task And Execution Time. The Results Have Proved That An Average Schedule Length Measured In Seconds Of The Ant Lion

Optimizer Performs Better. This Is By Lowering The Length Of The Schedule By About 4.1%, By 4.5%, By 4.46%, By 3.25% And Finally By 4.77% For The Number Of Jobs That Are 300, 600, 900, 1200 And 1500 Respectively Compared To The Pso.

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