Papers on Network Resource Allocation

> 🌟 We have released Virne, a python framework providing various algorithms for Virtual Network Embedding (VNE) problem

This is a paper list about Network Resource Allocation in Software-Defined Networking (SDN) and Network Functions Virtualization (NFV), including

- Comprehensive **Survey** and **Analysis**
- **Slicing**: Network Slicing
- **Chaining**: VNF Chaining (aka SFC Orchestration)
- **Deployment**: VNF Deployment (aka SFC Deployment)
- **Scheduling**: VNF Scheduling (including Scaling, Reconfiguration and Migration)
- **Routing**: Network Traffic Measurement and Management
- **Multi-domain** (aka cross-domain, multi-region or other resemble name)

Here, VNF - Virtual Network Function and SFC - Service Function Chain.
We mainly collect papers from high-quality journals and conferences, and classify them according to method categories. Particularly, you can find more details of papers in the **Machine Learning-based** section, which represents an encouraging technique to efficiently solve network resource allocation problems.

Search by Keywords

You can search the relevant papers by following keywords:

- **Direction**: `Chaining`, `Deployment`, `Scheduling`, `Routing`, `Joint`
- **Publication**: `SIGCOMM`,`INFOCOM`, `JSAC`, `TON`,`TMC`, `TPDS`, `TSC, ...
- **PUB-rank**: `CCF-A`, `CCF-B`, `JCR-Q1`, ...
- **Scenario**: `Dsitributed`, `IoT`, `Edge`, `Mobile`, `Optical Network`, ...
- **Awareness**: `Latency`, `Congestion`, `Privacy`, `Energy`, `Parallelization`, `Reliability`, `Multicast`
- **RL-ALGO**: `DQN`, `DDPG`, `A3C`, `PPO`, ...
- **NN-type**: `CNN`, `RNN`, `GNN`, ...

Repository & Website

- Repository: More timely updates
- Website: Better reading experience

Content

1. Survey and Analysis

1. **Network Services Anomalies in NFV: Survey, Taxonomy, and Verification Methods**
    - `Publication`: TNSM 2022 (**JCR-Q1**)
    - `Authors`: Moubarak Zoure;Toufik Ahmed;Laurent Réveillére
    - `Link`: IEEE Xplore
2. **Recent Advances of Resource Allocation in Network Function Virtualization**
    - `Publication`: TPDS 2021 (**CCF-A**)
    - `Authors`: Song Yang, Fan Li, Stojan Trajanovski, Ramin Yahyapour, Xiaoming Fu
    - `Link`: IEEE Xplore
3. **A Survey of Network Virtualization Techniques for Internet of Things Using SDN and NFV**
    - `Publication`: TPDS 2021 (**CCF-A**)
    - `Authors`: Iqbal Alam, Kashif Sharif, Fan Li, Zohaib Latif, M. M. Karim, Sujit Biswas, Boubakr Nour, Yu Wang
    - `Link`: ACM DL
4. **ONETS: Online Network Slice Broker From Theory to Practice**
    - `Publication`: TWC 2021 (**CCF-B**)
    - `Authors`: Vincenzo Sciancalepore; Lanfranco Zanzi; Xavier Costa-Pérez; Antonio Capone
    - `Link`: IEEE Xplore
5. **Graph-based Deep Learning for Communication Networks: A Survey**
    - `Publication`: arXiv 2021
    - `Authors`: Weiwei Jiang
    - `Link`: arXiv
6. **On the Hardness and Inapproximability of Virtual Network Embeddings**
    - `Publication`: TON 2020 (**CCF-A**)
    - `Authors`: Matthias Rost and Stefan Schmid
    - `Link`: paper
7. **SDN/NFV-Empowered Future IoV With Enhanced Communication, Computing, and Caching**
    - `Publication`: Proc. IEEE 2020 (**CCF-A**)
    - `Authors`: Weihua Zhuang; Qiang Ye; Feng Lyu; Nan Cheng; Ju Ren

- `Link`: IEEE Xplore

8. **Survey of Performance Acceleration Techniques for Network Function Virtualization**
   - `Publication`: Proc. IEEE 2019 (**CCF-A**)
   - `Authors`: Leonardo Linguaglossa; Stanislav Lange; Salvatore Pontarelli; Gábor Rétvári; Dario Rossi; Thomas Zinner; Roberto Bifulco; Michael; Jarschel; Giuseppe Bianchi
   - `Link`: IEEE Xplore
9. **Will Serverless Computing Revolutionize NFV?**
   - `Publication`: Proc. IEEE 2019 (**CCF-A**)
   - `Authors`: Paarijaat Aditya; Istemi Ekin Akkus; Andre Beck; Ruichuan Chen; Volker Hilt; Ivica Rimac; Klaus Satzke; Manuel Stein
   - `Link`: IEEE Xplore
10. **5G network slicing using SDN and NFV: A survey of taxonomy, architectures and future challenges**
    - `Publication`: CN 2020 (**CCF-B**)
    - `Authors`: Alcardo AlexBarakabitze, ArslanAhmad, Rashid Mijumb, Andrew Hinesd
    - `Link`: ScienceDirect
11. **Routing via Functions in Virtual Networks: The Curse of Choices**
    - `Publication`: TON 2019 (**CCF-A**)
    - `Authors`: Thi-Minh Nguyen; André Girard; Catherine Rosenberg; Serge Fdida
    - `Link`: IEEE Xplore
12. **A Survey on the Placement of Virtual Resources and Virtual Network Functions**
    - `Publication`: IEEE Communications Surveys & Tutorials 2019 (**JCR-Q1**)
    - `Authors`: Abdelquoddouss Laghrissi and Tarik Taleb
    - `Link`: paper
13. **Dependability of the NFV Orchestrator: State of the Art and Research Challenges**
    - `Publication`: IEEE Communications Surveys & Tutorials 2018 (**JCR-Q1**)
    - `Authors`: Andres J. Gonzalez; Gianfranco Nencioni; Andrzej Kamisiński; Bjarne E. Helvik; Poul E. Heegaard
    - `Link`: IEEE Xplore
14. **Network Slicing and Softwarization: A Survey on Principles, Enabling Technologies, and Solutions**
    - `Publication`: IEEE Communications Surveys & Tutorials 2018 (**JCR-Q1**)
    - `Authors`: Ibrahim Afolabi; Tarik Taleb; Konstantinos Samdanis; Adlen Ksentini; Hannu Flinck
    - `Link`: IEEE Xplore
15. **A Comprehensive Survey of Network Function Virtualization**
    - `Publication`: CN 2018 (**CCF-B**)
    - `Authors`: Bo Yi, Xingwei Wang, Keqin Li, Sajal k. Das , Min Huang
    - `Link`: ScienceDirect
16. **Network Function Virtualization: State-of-the-Art and Research Challenges**
    - `Publication`: IEEE Communications Surveys & Tutorials 2016 (**JCR-Q1**)
    - `Authors`: Rashid Mijumbi; Joan Serrat; Juan-Luis Gorricho;Niels Bouten; Filip De Turck; Raouf Boutaba
    - `Link`: IEEE Xplore
17. **Survey on Network Virtualization Hypervisors for Software Defined Networking**

- `Publication`: IEEE Communications Surveys & Tutorials 2016 (**JCR-Q1**)
- `Authors`: Andreas Blenk; Arsany Basta; Martin Reisslein; Wolfgang Kellerer
- `Link`: IEEE Xplore

18. **Resource Allocation in NFV: A Comprehensive Survey**
    - `Publication`: TNSM 2016 (**JCR-Q1**)
    - `Authors`: Juliver Gil Herrera, Juan Felipe Botero
    - `Link`: IEEE Xplore
19. **A Survey on Service Function Chaining**
    - `Publication`: Journal of Network and Computer Applications 2016 (**JCR-Q1**)
    - `Authors`: Deval Bhamare, Raj Jain, Mohammed Samaka, Aiman Erbad
    - `Link`: paper
20. **Virtual Network Embedding: A Survey**
    - `Publication`: IEEE Communications Surveys & Tutorials 2013 (**JCR-Q1**)
    - `Authors`: Andreas Fischer; Juan Felipe Botero; Michael Till Beck; Hermann de Meer; Xavier Hesselbach
    - `Link`: IEEE Xplore

2. Mathematical-based Methods

> Solving these problems with exact mathematical methods usually needs expensive computing resources and running time, which limits its applications in most realistic scenarios.

2.3 Deployment

1. **A novel evaluation function for higher acceptance rates and more profitable metaheuristic-based online virtual network embedding**
    - `Publication`: CN 2021 (**CCF-B**)
    - `Authors`: ChristianAguilar-Fuster, JavierRubio-Loyola
    - `Keywords`: Deployment, VNE, Evaluation functions, Fitness landscape
    - `Objective`: Revenue-to-cost ratio+
    - `Link`: ScienceDirect
2. **Enhancing Metaheuristic-Based Online Embedding in Network Virtualization Environments**
    - `Publication`: TNSM 2018 (**JCR-Q1**)
    - `Authors`: Javier Rubio-Loyola, Christian Aguilar-Fuster, Gregorio Toscano-Pulido, Rashid Mijumbi, and Joan Serrat-Fernández
    - `Keywords`: Deployment, VNE, Fitness Function
    - `Objective`: Revenue-to-cost ratio+
    - `Link`: IEEE Xplore

3. Heuristic-based Methods

> Here are many heuristic-based and meta-heuristic-based methods, only part of which recently published are displayed directly. You can obtain more papers by clicking `more` button.

3.1 Slicing

1. **Multiservice-Based Network Slicing Orchestration With Impatient Tenants**
   - `Publication`: TWC 2022 (**CCF-B**)
   - `Authors`: Bin Han; Vincenzo Sciancalepore; Xavier Costa-Pérez; Di Feng; Hans D. Schotten
   - `Keywords`: Slicing, Orchestration
   - `Objective`: Delay -
   - `Link`: IEEE Xplore
2. **ONETS: Online Network Slice Broker From Theory to Practice**
   - `Publication`: TWC 2022 (**CCF-B**)
   - `Authors`: Vincenzo Sciancalepore; Lanfranco Zanzi; Xavier Costa-Pérez; Antonio Capone
   - `Keywords`: Slicing
   - `Objective`: /
   - `Link`: IEEE Xplore
3. **Toward Enabling Network Slice Mobility to Support 6G System**
   - `Publication`: TWC 2022 (**CCF-B**)
   - `Authors`: Miloud Bagaa; Diego Leonel Cadette Dutra; Tarik Taleb; Hannu Flinck
   - `Keywords`: Slicing, 6G, Multiobjective Optimization
   - `Objective`: Delay -
   - `Link`: IEEE Xplore
4. **Coordinated 5G Network Slicing: How Constructive Interference Can Boost Network Throughput**
   - `Publication`: TON 2021 (**CCF-A**)
   - `Authors`: Salvatore D'Oro; Leonardo Bonati; Francesco Restuccia; Tommaso Melodia
   - `Keywords`: Slicing, Radio access network (RAN)
   - `Objective`: /
   - `Link`: IEEE Xplore
5. **An Efficient Linear Programming Rounding-and-Refinement Algorithm for Large-Scale Network Slicing Problem**
   - `Publication`: ICASSP 2021 (**CCF-A**)
   - `Authors`: Wei-Kun Chen; Ya-Feng Liu; Yu-Hong Dai; Zhi-Quan Luo
   - `Keywords`: Slicing, Large-Scale, Linear Programming, Rounding-and-Refinement
   - `Objective`: /
   - `Link`: IEEE Xplore
6. **LACO: A Latency-Driven Network Slicing Orchestration in Beyond-5G Networks**
   - `Publication`: TWC 2022 (**CCF-B**)
   - `Authors`: Lanfranco Zanzi; Vincenzo Sciancalepore; Andres Garcia-Saavedra; Hans Dieter Schotten; Xavier

Costa-Pérez

- `Keywords`: Slicing, Orchestration, Multi-armed-bandit-based (MAB)
- `Objective`: Delay -
- `Link`: IEEE Xplore

7. **A Coverage-Aware Resource Provisioning Method for Network Slicing**
   - `Publication`: TON 2020 (**CCF-A**)
   - `Authors`: Quang-Trung Luu; Sylvaine Kerboeuf; Alexandre Mouradian; Michel Kieffer
   - `Keywords`: Slicing
   - `Objective`: /
   - `Link`: IEEE Xplore
8. **End-to-end network slicing for future wireless in multi-region cloud platforms**
   - `Publication`: CN 2020 (**CCF-B**)
   - `Authors`: Simona Marinova , Thomas Lin, Hadi Bannazadeh, Alberto Leon-Garcia
   - `Keywords`: Slicing, Multi-domain, E2E (End-to-end), network slicing
   - `Objective`: /
   - `Link`: ScienceDirect
9. **Optimization Model for Cross-Domain Network Slices in 5G Networks**
   - `Publication`: TMC 2019 (**CCF-A**)
   - `Authors`: Rami Akrem Addad; Miloud Bagaa; Tarik Taleb; Diego Leonel Cadette Dutra; Hannu Flinck
   - `Keywords`: Slicing, Multi-domain
   - `Objective`: Placement cost -, Latency -
   - `Link`: IEEE Xplore
10. **Multi-Tenant Radio Access Network Slicing: Statistical Multiplexing of Spatial Loads**
    - `Publication`: TON 2017 (**CCF-A**)
    - `Authors`: Pablo Caballero; Albert Banchs; Gustavo de Veciana; Xavier Costa-Pérez
    - `Keywords`: Slicing
    - `Objective`: Cost -
    - `Link`: IEEE Xplore

3.2 Chaining

1. **Leveraging Network Functions Virtualization Orchestrators to Achieve Software-Defined Access Control in the Clouds**
   - `Publication`: TDSC 2021 (**CCF-A**)
   - `Authors`: Montida Pattaranantakul; Ruan He; Zonghua Zhang; Ahmed Meddahi; Ping Wang
   - `Keywords`: Chaining
   - `Objective`: Throughput +
   - `Link`: IEEE Xplore
2. **Combined Stateful Classification and Session Splicing for High-Speed NFV Service Chaining**
   - `Publication`: TON 2021 (**CCF-A**)
   - `Authors`: Tom Barbette; Cyril Soldani; Laurent Mathy

- `Keywords`: Chaining, High-Speed
- `Objective`: Speed +
- `Link`: IEEE Xplore

3. **Toward Optimal Partial Parallelization for Service Function Chaining**
   - `Publication`: TON 2021 (**CCF-A**)
   - `Authors`: I-Chieh Lin; Yu-Hsuan Yeh; Kate Ching-Ju Lin
   - `Keywords`: Chaining, Parallelization
   - `Objective`: Latency -, Parallelization +
   - `Link`: IEEE Xplore
4. **A Scalable Stateful Approach for Virtual Security Functions Orchestration**
   - `Publication`: TPDS 2021 (**CCF-A**)
   - `Authors`: Niloofar Moradi; Alireza Shameli-Sendi; Alireza Khajouei
   - `Keywords`: Chaining, Scalable
   - `Objective`: Cost -
   - `Link`: IEEE Xplore
5. **Toward a Real Deployment of Network Services Orchestration and Configuration Convergence Framework for 5G Network Slices**
   - `Publication`: IEEE Network 2021 (**JCR-1**)
   - `Authors`: Ibrahim Afolabi; Miloud Bagaa; Walid Boumezer; Tarik Taleb
   - `Keywords`: Chaining, Deployment, Joint, Network Slice, Distributed
   - `Objective`: Framework
   - `Link`: IEEE Xplore
6. **Slicing-based Reliable Resource Orchestration for Secure Software Defined Edge-Cloud Computing Systems**
   - `Publication`: IoTJ 2021 (**JCR-1**)
   - `Authors`: Ahmadreza Montazerolghaem
   - `Keywords`: Chaining, IoT, Network Slice
   - `Objective`: Placement cost -, Latency -
   - `Link`: IEEE Xplore

▶ more

1. **FlexNF: Flexible Network Function Orchestration on the Programmable Data Plane**
   - `Publication`: IWQOS 2021 (**CCF-B**)
   - `Authors`: Hanyu Zhao; Qing Li; Jingpu Duan; Yong Jiang; Kai Liu
   - `Keywords`: Chaining, Programmable Data Plane
   - `Objective`: Acceptance rate +
   - `Link`: IEEE Xplore
2. **Log Management in NFV Service Orchestration**
   - `Publication`: SECON 2021 (**CCF-B**)
   - `Authors`: Engin Zeydan; Jorge Baranda; Josep Mangues-Bafalluy; Ricardo Martínez; Luca Vettori
   - `Keywords`: Chaining, Log
   - `Objective`: Log
   - `Link`: IEEE Xplore

3. **On Cross-domain Service Function Chain orchestration: An architectural framework**
    - `Publication`: CN 2021 (**CCF-B**)
    - `Authors`: Nassima Toumi, Olivier Bernier, Djamal-Eddine Meddour, Adlen Ksentini
    - `Keywords`: Chaining, Multi-domain
    - `Objective`: Framework
    - `Link`: ScienceDirect
4. **Towards Latency Optimization in Hybrid Service Function Chain Composition and Embedding**
    - `Publication`: INFOCOM 2020 (**CCF-A**)
    - `Authors`: Panpan Jin; Xincai Fei; Qixia Zhang; Fangming Liu; Bo Li
    - `Keywords`: Chaining, Deployment, HSFCE (Hybrid SFC composition and Embedding), Latency-aware, Betweenness Centrality
    - `Objective`: Latency
    - `Link`: IEEE Xplore
5. **Multiservice-Based Network Slicing Orchestration With Impatient Tenants**
    - `Publication`: TMC 2020 (**CCF-A**)
    - `Authors`: Ibrahim Afolabi; Jonathan Prados-Garzon; Miloud Bagaa; Tarik Taleb; Pablo Ameigeiras
    - `Keywords`: Chaining, Dynamic
    - `Objective`: /
    - `Link`: IEEE Xplore
6. **Multiservice-Based Network Slicing Orchestration With Impatient Tenants**
    - `Publication`: TWC 2020 (**CCF-B**)
    - `Authors`: PDF Bin Han; Vincenzo Sciancalepore; Xavier Costa-Pérez; Di Feng; Hans D. Schotten
    - `Keywords`: Chaining
    - `Objective`: /
    - `Link`: IEEE Xplore
7. **pSMART: A lightweight, privacy-aware service function chain orchestration in multi-domain NFV/SDN**
    - `Publication`: CN 2020 (**CCF-B**)
    - `Authors`: Kalpana D. Joshi , Kotaro Kataoka
    - `Keywords`: Chaining, Multi-domain, Privacy
    - `Objective`: Utilize less sensitive information, to reduce privacy and security risks
    - `Link`: ScienceDirect
8. **A Scalable Stateful Approach for Virtual Security Functions Orchestration**
    - `Publication`: TPDS 2019 (**CCF-A**)
    - `Authors`: Lin Cui; Fung Po Tso; Song Guo; Weijia Jia; Kaimin Wei; Wei Zhao
    - `Keywords`: Chaining, Heterogeneous
    - `Objective`: Cost -
    - `Link`: IEEE Xplore
9. **VirtualEdge: Multi-Domain Resource Orchestration and Virtualization in Cellular Edge Computing**
    - `Publication`: ICDCS 2019 (**CCF-B**)
    - `Authors`: Qiang Liu; Tao Han

- `Keywords`: Chaining, Deployment, Multi-Domain
- `Objective`: Placement cost -
- `Link`: IEEE Xplore

3.3 Deployment

1. **Online Service Function Chain Placement for Cost-effectiveness and Network Congestion Control**
   - `Publication`: TC 2022 (**CCF-A**)
   - `Authors`: Xiaojun Shang; Zhenhua Liu; Yuanyuan Yang
   - `Keywords`: Deployment, Routing, Online candidate path selection (OCPS)
   - `Objective`: Latency -, Placement cost -
   - `Link`: IEEE Xplore
2. **Multi-Resource VNF Deployment in a Heterogeneous Cloud**
   - `Publication`: TC 2022 (**CCF-A**)
   - `Authors`: Jiaqi Zheng; Zixuan Zhang; Qiufang Ma; Xiaofeng Gao; Chen Tian; Guihai Chen
   - `Keywords`: Deployment, Multi-Resource, Heterogeneous Cloud
   - `Objective`: Placement cost -
   - `Link`: IEEE Xplore
3. **SFT-Box: An Online Approach for Minimizing the Embedding Cost of Multiple Hybrid SFCs**
   - `Publication`: TON 2022 (**CCF-A**) (Early Access)
   - `Authors`: Xu Lin; Deke Guo; Yulong Shen; Guoming Tang; Bangbang Ren; Ming Xu
   - `Keywords`: Deployment, Online algorithm
   - `Objective`: Placement cost -
   - `Link`: IEEE Xplore
4. **Optimal Embedding of Aggregated Service Function Tree**
   - `Publication`: TPDS 2022 (**CCF-A**)
   - `Authors`: Deke Guo; Bangbang Ren; Guoming Tang; Lailong Luo; Tao Chen; Xiaoming Fu
   - `Keywords`: Deployment, aggregated service function tree, approximation algorithm
   - `Objective`: Placement cost -
   - `Link`: IEEE Xplore
5. **Online Reliability-Enhanced Virtual Network Services Provisioning in Fault-Prone Mobile Edge Cloud**
   - `Publication`: TWC 2022 (**CCF-B**)
   - `Authors`: Yu Qiu; Junbin Liang; Victor C. M. Leung; Xu Wu; Xia Deng
   - `Keywords`: Deployment, Reliability, approximation algorithm
   - `Objective`: Placement cost -, Throughput +, Reliability +
   - `Link`: IEEE Xplore
6. **Maximum Flow Routing Strategy for Space Information Network With Service Function Constraints**
   - `Publication`: TWC 2022 (**CCF-B**)
   - `Authors`: Huiting Yang; Wei Liu; Hongyan Li; Jiandong Li
   - `Keywords`: Deployment, Commodity maximum flow
   - `Objective`: Placement cost -

- `Link`: IEEE Xplore

7. **CoShare: An Efficient Approach for Redundancy Allocation in NFV**
   - `Publication`: TON 2021 (**CCF-A**) (Early Access)
   - `Authors`: Yordanos Tibebu Woldeyohannes; Besmir Tola; Yuming Jiang; K. K. Ramakrishnan
   - `Keywords`: Deployment, Redundancy Allocation, Reliablity
   - `Objective`: Reliablity -
   - `Link`: IEEE Xplore
8. **Latency-Sensitive Edge/Cloud Serverless Dynamic Deployment Over Telemetry-Based Packet-Optical Network**
   - `Publication`: JSAC 2021 (**CCF-A**)
   - `Authors`: István Pelle; Francesco Paolucci; Balázs Sonkoly; Filippo Cugini
   - `Keywords`: Deployment, Latency, Optical Network
   - `Objective`: Placement cost -, Latency -
   - `Link`: IEEE Xplore
9. **Prune and Plant: Efficient Placement and Parallelism of Virtual Network Functions**
   - `Publication`: TC 2021 (**CCF-A**)
   - `Authors`: Wei Bao; Dong Yuan; Bing Bing Zhou; Albert Y. Zomaya
   - `Keywords`: Deployment, Parallelization, Prune and Plant
   - `Objective`: Placement cost -, Latency -
   - `Link`: IEEE Xplore
10. **Prioritized Deployment of Dynamic Service Function Chains**
    - `Publication`: TC 2021 (**CCF-A**)
    - `Authors`: Xiaojun Shang; Zhenhua Liu; Yuanyuan Yang
    - `Keywords`: Deployment, Prioritized
    - `Objective`: Latency -, Placement cost -
    - `Link`: IEEE Xplore
11. **Mobility-Aware and Delay-Sensitive Service Provisioning in Mobile Edge-Cloud Networks**
    - `Publication`: TC (Early Access) (**CCF-A**)
    - `Authors`: Yu Ma; Weifa Liang; Jing Li; Xiaohua Jia; Song Guo
    - `Keywords`: Deployment, Mobility, Latency
    - `Objective`: Latency -, Mobility +, Placement cost -
    - `Link`: IEEE Xplore
12. **Request Reliability Augmentation with Service Function Chain Requirements in Mobile Edge Computing**
    - `Publication`: TMC 2021 (**CCF-A**)
    - `Authors`: Weifa Liang; Yu Ma; Wenzheng Xu; Zichuan Xu; Xiaohua Jia; Wanlei Zhou
    - `Keywords`: Deployment, Reliability
    - `Objective`: Reliability +
    - `Link`: IEEE Xplore
13. **Delay-Aware Virtual Network Function Placement and Routing in Edge Clouds**
    - `Publication`: TMC 2021 (**CCF-A**)

- `Authors`: Song Yang; Fan Li; Stojan Trajanovski; Xu Chen; Yu Wang; Xiaoming Fu
- `Keywords`: Deployment, Latency
- `Objective`: Latency -
- `Link`: IEEE Xplore

14. **Online Adaptive Interference-Aware VNF Deployment and Migration for 5G Network Slice**
    - `Publication`: TON 2021 (**CCF-A**)
    - `Authors`: Qixia Zhang; Fangming Liu; Chaobing Zeng
    - `Keywords`: Deployment, Scheduling, Joint
    - `Objective`: Acceptance rate +, Migration cost -
    - `Link`: IEEE Xplore
15. **Joint Placement and Allocation of VNF Nodes With Budget and Capacity Constraints**
    - `Publication`: TON 2021 (**CCF-A**)
    - `Authors`: Gamal Sallam; Bo Ji
    - `Keywords`: Deployment, Relaxation
    - `Objective`: Cost -
    - `Link`: IEEE Xplore
16. **Service Placement and Request Scheduling for Data-Intensive Applications in Edge Clouds**
    - `Publication`: TON 2021 (**CCF-A**)
    - `Authors`: Vajiheh Farhadi; Fidan Mehmeti; Ting He; Thomas F. La Porta; Hana Khamfroush; Shiqiang Wang
    - `Keywords`: Deployment, Scheduling, Joint
    - `Objective`: Acceptance rate +, Migration cost -
    - `Link`: IEEE Xplore
17. **Incremental Server Deployment for Software-Defined NFV-Enabled Networks**
    - `Publication`: TON 2021 (**CCF-A**)
    - `Authors`: Jianchun Liu; Hongli Xu; Gongming Zhao; Chen Qian; Xingpeng Fan; Xuwei Yang; He Huang
    - `Keywords`: Incremental Server Deployment
    - `Objective`: Cost -
    - `Link`: IEEE Xplore
18. **Efficient Virtual Network Embedding of Cloud-Based Data Center Networks into Optical Networks**
    - `Publication`: TPDS 2021 (**CCF-A**)
    - `Authors`: Weibei Fan; Fu Xiao; Xiaobai Chen; Lei Cui; Shui Yu
    - `Keywords`: Deployment, Optical Networks
    - `Objective`: Placement cost -
    - `Link`: IEEE Xplore
19. **Joint SFC Deployment and Resource Management in Heterogeneous Edge for Latency Minimization**
    - `Publication`: TPDS 2021 (**CCF-A**)
    - `Authors`: Yu Liu; Xiaojun Shang; Yuanyuan Yang
    - `Keywords`: Deployment, Scheduling, Joint, Heterogeneous, Edge, Latency
    - `Objective`: Placement cost -, Latency -
    - `Link`: IEEE Xplore

20. **Dynamic Network Function Provisioning to Enable Network in Box for Industrial Applications**
    - `Publication`: TII 2021 (**JCR-Q1**)
    - `Authors`: Gang Sun; Zhu Xu; Hongfang Yu; Victor Chang
    - `Keywords`: Deployment, Path Selection
    - `Objective`: Cost -
    - `Link`: IEEE Xplore
21. **Joint Virtual Network Topology Design and Embedding for Cybertwin-Enabled 6G Core Networks**
    - `Publication`: IoTJ 2021 (**JCR-1**)
    - `Authors`: Junling Li; Weisen Shi; Qiang Ye; Shan Zhang; Weihua Zhuang; Xuemin Shen
    - `Keywords`: Deployment, Joint, Latency
    - `Objective`: Placement cost -
    - `Link`: IEEE Xplore
22. **Energy-Aware Service Function Chain Embedding in Edge–Cloud Environments for IoT Applications**
    - `Publication`: IoTJ 2021 (**JCR-1**)
    - `Authors`: Nguyen Huu Thanh; Nguyen Trung Kien; Ngo Van Hoa; Truong Thu Huong; Florian Wamser; Tobias Hossfeld
    - `Keywords`: Deployment, IoT, Edge, Energy
    - `Objective`: Energy consumption -, Latency -
    - `Link`: IEEE Xplore
23. **Profit-aware Edge Server Placement**
    - `Publication`: IoTJ 2021 (**JCR-1**)
    - `Authors`: Yuanzhe Li; Ao Zhou; Xiao Ma; Shangguang Wang
    - `Keywords`: Deployment, Edge
    - `Objective`: Energy consumption -, Latency -
    - `Link`: IEEE Xplore

▶ more

1. **Virtual Network Function Allocation in Service Function Chains Using Backups With Availability Schedule**
    - `Publication`: TNSM 2021 (**JCR-Q1**)
    - `Authors`: Rui Kang; Fujun He; Eiji Oki
    - `Keywords`: Deploymeny, Availability Schedule, Reliablity
    - `Objective`: Reliablity +
    - `Link`: IEEE Xplore
2. **Reliable Placement of Service Function Chains and Virtual Monitoring Functions With Minimal Cost in Softwarized 5G Networks**
    - `Publication`: TNSM 2021 (**JCR-Q1**)
    - `Authors`: Prabhu Kaliyammal Thiruvasagam; Abhishek Chakraborty; Abin Mathew; C. Siva Ram Murthy
    - `Keywords`: Deployment, VNE, Optical Network, Data Center
    - `Objective`: Reduce complexity of the network topology by using the parallel transmission characteristics of optical fiber
    - `Link`: IEEE Xplore
3. **VNF-Based Service Provision in Software Defined LEO Satellite Networks**

- `Publication`: TWC 2021 (**CCF-B**)
- `Authors`: Ziye Jia; Min Sheng; Jiandong Li; Di Zhou; Zhu Han
- `Keywords`: Deployment, Branch-and-price, Beam search
- `Objective`: Placement cost -
- `Link`: IEEE Xplore

4. **Optimal Virtual Network Embeddings for Tree Topologies**
   - `Publication`: SPAA 2021 (**CCF-B**)
   - `Authors`: Aleksander Figiel, Leon Kellerhals, Rolf Niedermeier, Matthias Rost, Stefan Schmid, Philipp Zschoche
   - `Keywords`: Deployment, VNE, parameterized complexity
   - `Objective`: Running time -
   - `Link`: ACM DL
5. **Dynamic VNF Placement, Resource Allocation and Traffic Routing in 5G**
   - `Publication`: CN 2021 (**CCF-B**)
   - `Authors`: Morteza Golkarifard, C. Chiasserini, F. Malandrino, A. Movaghar
   - `Keywords`: Deployment, Routing
   - `Objective`: Placement cost -
   - `Link`: arXiv
6. **Efficient Virtual Network Embedding of Cloud-Based Data Center Networks into Optical Networks**
   - `Publication`: TSC 2021 (**CCF-A**)
   - `Authors`: Weibei Fan; Fu Xiao; Xiaobai Chen; Lei Cui; Shui Yu
   - `Keywords`: Deployment, Integer Linear Programming (ILP)
   - `Objective`: Placement cost -
   - `Link`: IEEE Xplore
7. **Energy and Cost Efficient Resource Allocation for Blockchain-Enabled NFV**
   - `Publication`: TSC 2021 (**CCF-A**)
   - `Authors`: Shiva Kazemi Taskou, Mehdi Rasti, Pedro H. J. Nardelli
   - `Keywords`: Deployment, Blockchain-Enabled, HuRA (Hungarian-based Resource Allocation), HuRA (Hungarian-based Resource Allocation)
   - `Objective`: Energy consumption -, Placement cost -
   - `Link`: paper
8. **Latency-aware VNF Chain Deployment with Efficient Resource Reuse at Network Edge**
   - `Publication`: INFOCOM 2020 (**CCF-A**)
   - `Authors`: Panpan Jin; Xincai Fei; Qixia Zhang; Fangming Liu; Bo Li
   - `Keywords`: Deployment, MILP (Mixed Integer linear Programming), Latency, CDFSA (constrained depth-first search algorithm)
   - `Objective`: Placement cost -, E2E Latency-
   - `Link`: paper
9. **SFC-Based Service Provisioning for Reconfigurable Space-Air-Ground Integrated Networks**
   - `Publication`: JSAC 2020 (**CCF-A**)
   - `Authors`: Guangchao Wang; Sheng Zhou; Shan Zhang; Zhisheng Niu; Xuemin Shen
   - `Keywords`: Deployment, Routing, Joint, Space-Air-Ground

- `Objective`: Acceptance rate+, Placement cost -
- `Link`: IEEE Xplore

10. **A Virtual Network Customization Framework for Multicast Services in NFV-Enabled Core Networks**
    - `Publication`: JSAC 2020 (**CCF-A**)
    - `Authors`: Omar Alhussein; Phu Thinh Do; Qiang Ye; Junling Li; Weisen Shi; Weihua Zhuang; Xuemin Shen; Xu Li; Jaya Rao
    - `Keywords`: Deployment, Multipath routing, Joint
    - `Objective`: Acceptance rate+, Placement cost -
    - `Link`: IEEE Xplore
11. **An Online Algorithm for VNF Service Chain Scaling in Datacenters**
    - `Publication`: TON 2020 (**CCF-A**)
    - `Authors`: Ziyue Luo, Chuan Wu
    - `Keywords`: Deployment, ILP (Integer Linear Program), Regularization, Rounding
    - `Objective`: Operating cost -, Placement cost -
    - `Link`: paper
12. **Reliability-Aware Virtualized Network Function Services Provisioning in Mobile Edge Computing**
    - `Publication`: TON 2020 (**CCF-A**)
    - `Authors`: Meitian Huang, Weifa Liang, Xiaojun Shen, Yu Ma, Haibin Kan
    - `Keywords`: Deployment, Reliability-aware, approximation algorithms, DP (dynamic programming), MEC (mobile edge computing)
    - `Objective`: Maximize the network throughput
    - `Link`: IEEE Xplore
13. **Service Function Path Provisioning With Topology Aggregation in Multi-Domain Optical Networks**
    - `Publication`: TON 2020 (**CCF-A**)
    - `Authors`: Boyuan Yan; Yongli Zhao; Xiaosong Yu; Yajie Li; Sabidur Rahman; Yongqi He; Xiangjun Xin; Jie Zhang
    - `Keywords`: Deployment, Multi-domain
    - `Objective`: /
    - `Link`: IEEE Xplore
14. **Joint Resource Allocation and Routing for Service Function Chaining with In-Subnetwork Processing**
    - `Publication`: ICASSP 2020 (**CCF-B**)
    - `Authors`: Navid Reyhanian; Hamid Farmanbar; Soheil Mohajer; Zhi-Quan Luo
    - `Keywords`: Deployment, Routing
    - `Objective`: Placement cost -
    - `Link`: IEEE Xplore
15. **Congestion-Aware and Energy-Aware Virtual Network Embedding**
    - `Publication`: TON 2020 (**CCF-A**)
    - `Authors`: Minh Pham, Doan B. Hoang, Zenon Chaczko
    - `Keywords`: Deployment, relaxed LP (linear Program), Congestion, Energy, SR (Segment Routing)
    - `Objective`: Placement cost -, Energy Consumption -, Network congestion -
    - `Link`: IEEE Xplore
16. **Efficient Algorithms for Delay-Aware NFV-Enabled Multicasting in Mobile Edge Clouds With Resource Sharing**

- `Publication`: TPDS 2020 (**CCF-A**)
- `Authors`: Haozhe Ren; Zichuan Xu; Weifa Liang; Qiufen Xia; Pan Zhou; Omer F. Rana; Alex Galis; Guowei Wu
- `Keywords`: Deployment, Latency
- `Objective`: Latency -
- `Link`: IEEE Xplore

17. **Sova: A Software-Defined Autonomic Framework for Virtual Network Allocations**
    - `Publication`: TPDS 2020 (**CCF-A**)
    - `Authors`: Zhiyong Ye, Yang Wang, Shuibing He, Chengzhong Xu, Xian-He Sun
    - `Keywords`: Deployment, VNFM, SDN
    - `Objective`: Optimize the network allocation between different services by coordinating virtual dynamic SR-IOV and virtual machine live migration in autonomic way
    - `Link`: IEEE Xplore
18. **Latency and Mobility-Aware Service Function Chain Placement in 5G Networks**
    - `Publication`: TMC 2020 (**CCF-A**)
    - `Authors`: Davit Harutyunyan; Nashid Shahriar; Raouf Boutaba; Roberto Riggio
    - `Keywords`: Deployment, Latency, Mobility, Edge computing
    - `Objective`: Latency -, Placement cost -, Energy consumption -, Qos +
    - `Link`: IEEE Xplore
19. **Clustered Virtualized Network Functions Resource Allocation based on Context-Aware Grouping in 5G Edge Networks**
    - `Publication`: TMC 2020 (**CCF-A**)
    - `Authors`: Sooeun Song; Changsung Lee; Hyoungjun Cho; Goeun Lim; Jong-Moon Chung
    - `Keywords`: Deployment, Latency, Mobility, Edge computing
    - `Objective`: Mobility +
    - `Link`: IEEE Xplore
20. **Reducing the Service Function Chain Backup Cost over the Edge and Cloud by a Self-adapting Scheme**
    - `Publication`: TMC 2020 (**CCF-A**)
    - `Authors`: Xiaojun Shang; Yaodong Huang; Zhenhua Liu; Yuanyuan Yang
    - `Keywords`: Deployment, Edge, Reliablity, Backup
    - `Objective`: Reliablity +
    - `Link`: IEEE Xplore
21. **Approximation algorithms for data-intensive service chain embedding**
    - `Publication`: MobiHoc 2020(**CCF-B**)
    - `Authors`: Konstantinos Poularakis, J. Llorca, A. Tulino, L. Tassiulas
    - `Keywords`: Deployment, Data-intensive
    - `Objective`: Placement cost -
    - `Link`: ACM DL
22. **Joint Availability- and Traffic-aware Placement of Parallelized Service Chain in NFV-enabled Data Center**
    - `Publication`: ICWS 2020 (**CCF-B**)
    - `Authors`: Meng Wang; Bo Cheng; Junliang Chen
    - `Keywords`: Deployment, Parallelization, Multi-flow backup, Hybrid Placement Algorithm (HPA)

- `Objective`: Latency -, Placement cost -
- `Link`: IEEE Xplore

23. **Optimal Virtual Network Function Deployment for 5G Network Slicing in a Hybrid Cloud Infrastructure**
    - `Publication`: TWC 2020 (**CCF-B**)
    - `Authors`: Antonio De Domenico, Ya-Feng Liu, Wei Yu
    - `Keywords`: Deployment, ILP (Integer Linear Programming), Network Slicing
    - `Objective`: Lead to high resource utilization efficiency and large gains in terms of the number of supported VNF chains
    - `Link`: IEEE Xplore
24. **Virtual Network Embedding With Guaranteed Connectivity Under Multiple Substrate Link Failures**
    - `Publication`: TCOM 2020 (**CCF-B**)
    - `Authors`: Nashid Shahriar; Reaz Ahmed; Shihabur Rahman Chowdhury; Md Mashrur Alam Khan; Raouf Boutaba; Jeebak Mitra; Feng Zeng
    - `Keywords`: Placement
    - `Objective`: Placement cost -
    - `Link`: IEEE Xplore
25. **Cost-Efficient VNF Placement and Scheduling in Public Cloud Networks**
    - `Publication`: TCOM 2020 (**CCF-B**)
    - `Authors`: Tao Gao, Xin Li, Yu Wu , Weixia Zou, Shanguo Huang, Massimo Tornatore, Biswanath Mukherjee
    - `Keywords`: Deployment, Scheduling, Cost Efficiency, Public Cloud
    - `Objective`: /
    - `Link`: IEEE Xplore
26. **Virtual Network Embedding With Guaranteed Connectivity Under Multiple Substrate Link Failures**
    - `Publication`: TCOM 2020 (**CCF-B**)
    - `Authors`: Zhiyong Ye, Yang Wang, Shuibing He, Chengzhong Xu, Xian-He Sun
    - `Keywords`: Deployment, Connectivity, Fault Tolerance, Redundancy
    - `Objective`: /
    - `Link`: IEEE Xplore
27. **Reliability Aware Service Placement Using a Viterbi-Based Algorithm**
    - `Publication`: TNSM 2020 (**JCR-Q1**)
    - `Authors`: Mohammad Karimzadeh-Farshbafan, Vahid Shah-Mansouri, Dusit Niyato
    - `Keywords`: Deployment, MICP (mixed integer convex programming), Viterbi-based
    - `Objective`: Minimize the cost of resources of the InPs and maximize the reliability of the service
    - `Link`: IEEE Xplore
28. **A Constructive Particle Swarm Optimizer for Virtual Network Embedding**
    - `Publication`: TNSE 2020 (**JCR-Q1**)
    - `Authors`: Yongqiang Gao; Haibing Guan; Zhengwei Qi; Yang Hou; Liang Liu
    - `Keywords`: Deployment, CPSO (Constructive Particle Swarm Optimizer)
    - `Objective`: Placement cost -
    - `Link`: IEEE Xplore
29. **Service Placement and Request Scheduling for Data-intensive Applications in Edge Clouds**

- `Publication`: INFOCOM 2019 (**CCF-A**)
- `Authors`: Vajiheh Farhadi; Fidan Mehmeti; Ting He; Tom La Porta; Hana Khamfroush; Shiqiang Wang; Kevin S Chan
- `Keywords`: Deployment, Scheduling, Mobile Edge
- `Objective`:Acceptance rate +
- `Link`: IEEE Xplore

30. **Adaptive Interference-Aware VNF Placement for Service-Customized 5G Network Slices**
    - `Publication`: INFOCOM 2019 (**CCF-A**)
    - `Authors`: Qixia Zhang, Fangming Liu, Chaobing Zeng
    - `Keywords`: Deployment, Interference
    - `Objective`:Acceptance rate +
    - `Link`: IEEE Xplore
31. **Octans: Optimal Placement of Service Function Chains in Many-Core Systems**
    - `Publication`: INFOCOM 2019 (**CCF-A**)
    - `Authors`: Zhilong Zheng; Jun Bi; Heng Yu; Haiping Wang; Chen Sun; Hongxin Hu; Jianping Wu
    - `Keywords`: Deployment, Many-Core Systems
    - `Objective`: Placement cost -
    - `Link`: IEEE Xplore
32. **DYVINE: Fitness-Based Dynamic Virtual Network Embedding in Cloud Computing**
    - `Publication`: JSAC 2019 (**CCF-A**)
    - `Authors`: Chinmaya Kumar Dehury; Prasan Kumar Sahoo
    - `Keywords`: Deployment, Dynamic, Multipath routing
    - `Objective`: Acceptance rate+, Placement cost -
    - `Link`: IEEE Xplore
33. **Energy-Efficient Machine-to-Machine (M2M) Communications in Virtualized Cellular Networks with Mobile Edge Computing (MEC)**
    - `Publication`: TMC 2019 (**CCF-A**)
    - `Authors`: Meng Li; F. Richard Yu; Pengbo Si; Yanhua Zhang
    - `Keywords`: Deployment, Mobile, Edge, Energy, partially observable Markov decision process (POMDP)
    - `Objective`: Placement cost -, Energy consumption -
    - `Link`: IEEE Xplore
34. **Network Topology Mapping From Partial Virtual Coordinates and Graph Geodesics**
    - `Publication`: TON 2019 (**CCF-A**)
    - `Authors`: Anura P. Jayasumana; Randy Paffenroth; Gunjan Mahindre; Sridhar Ramasamy; Kelum Gajamannage
    - `Keywords`: Deployment, Coordinates
    - `Objective`: Placement cost -
    - `Link`: IEEE Xplore
35. **Virtual Network Embedding Approximations: Leveraging Randomized Rounding**
    - `Publication`: TON 2019 (**CCF-A**)
    - `Authors`: Matthias Rost; Stefan Schmid
    - `Keywords`: Placement

- `Objective`: Placement cost -
- `Link`: IEEE Xplore

36. **Automated Function Placement and Online Optimization of Network Functions Virtualization**
    - `Publication`: TCOM 2019 (**CCF-B**)
    - `Authors`: Xiaojing Chen; Wei Ni; Iain B. Collings; Xin Wang; Shugong Xu
    - `Keywords`: Deployment, Latency
    - `Objective`: Placement cost -, Latency -
    - `Link`: IEEE Xplore
37. **Virtual Network Embedding with Path-based Latency Guarantees in Elastic Optical Networks**
    - `Publication`: ICNP 2019 (**CCF-B**)
    - `Authors`: Sepehr Taeb; Nashid Shahriar; Shihabur Rahman Chowdhury; Massimo Tornatore; Raouf Boutaba; Jeebak Mitra; Mahdi Hemmati
    - `Keywords`: Deployment, Optical Networks, Latency
    - `Objective`: Placement cost -, Latency -
    - `Link`: IEEE Xplore
38. **Network Function Deployment with Balanced Server and Link Resources in Tree Topologies**
    - `Publication`: SECON 2019 (**CCF-B**)
    - `Authors`: Yang Chen; Jie Wu
    - `Keywords`: Deployment, Tree Topology
    - `Objective`: Placement cost -
    - `Link`: IEEE Xplore
39. **Provably Efficient Algorithms for Placement of Service Function Chains with Ordering Constraints**
    - `Publication`: INFOCOM 2018 (**CCF-A**)
    - `Authors`: Ziyue Luo, Chuan Wu
    - `Keywords`: Deployment, Equivalence with Hitting Set, Naive and Faster Greedy, LP-Rounding, DP (Dynamic Programming)
    - `Objective`: Placement cost -
    - `Link`: paper
40. **Joint Placement and Routing of Network Function Chains in Data Centers**
    - `Publication`: INFOCOM 2018 (**CCF-A**)
    - `Authors`: Linqi Guo; John Pang; Anwar Walid
    - `Keywords`: Deployment, Routing, Joint, Data Center
    - `Objective`: Placement cost -
    - `Link`: IEEE Xplore
41. **Joint VNF Placement and CPU Allocation in 5G**
    - `Publication`: INFOCOM 2018 (**CCF-A**)
    - `Authors`: Satyam Agarwal; Francesco Malandrino; Carla-Fabiana Chiasserini; S. De
    - `Keywords`: Deployment, Joint
    - `Objective`: Joint optimal decisions concerning the placement of Scheduling across the physical hosts for realizing the services, and the allocation of CPU resources in Scheduling sharing a host
    - `Link`: IEEE Xplore

42. **Virtual Network Survivability Through Joint Spare Capacity Allocation and Embedding**
    - `Publication`: JSAC 2018 (**CCF-A**)
    - `Authors`: Nashid Shahriar; Shihabur Rahman Chowdhury; Reaz Ahmed; Aimal Khan; Siavash Fathi; Raouf Boutaba; Jeebak Mitra; Liu Liu
    - `Keywords`: Deployment, Reliability
    - `Objective`: Acceptance rate+, Reliability +
    - `Link`: IEEE Xplore
43. **Network Function Virtualization in Dynamic Networks: A Stochastic Perspective**
    - `Publication`: JSAC 2018 (**CCF-A**)
    - `Authors`:Xiangle Cheng; Yulei Wu; Geyong Min; Albert Y. Zomaya
    - `Keywords`: Deployment, Stochastic, Admission Control, decomposition method
    - `Objective`: Acceptance rate+
    - `Link`: IEEE Xplore
44. **vSPACE: VNF Simultaneous Placement, Admission Control and Embedding**
    - `Publication`: JSAC 2018 (**CCF-A**)
    - `Authors`: Mohammad Ali Tahmasbi Nejad; Saeedeh Parsaeefard; Mohammad Ali Maddah-Ali; Toktam Mahmoodi; Babak Hossein Khalaj
    - `Keywords`: Deployment, Joint, Admission Control, Splittable VNF, Multipath routing
    - `Objective`: Acceptance rate+
    - `Link`: IEEE Xplore
45. **Enabling Efficient Network Service Function Chain Deployment on Heterogeneous Server Platform**
    - `Publication`: HPCA 2018 (**CCF-A**)
    - `Authors`: Yang Hu; Tao Li
    - `Keywords`: Deployment, Graph-partition, Reorganizing
    - `Objective`: Placement cost -
    - `Link`: IEEE Xplore
46. **Multi-Timescale Online Optimization of Network Function Virtualization for Service Chaining**
    - `Publication`: TMC 2018 (**CCF-A**)
    - `Authors`: Xiaojing Chen; Wei Ni; Tianyi Chen; Iain B. Collings; Xin Wang; Ren Ping Liu; Georgios B. Giannakis
    - `Keywords`: Placement
    - `Objective`: Placement cost -
    - `Link`: IEEE Xplore
47. **Optimal Network Service Chain Provisioning**
    - `Publication`: TON 2018 (**CCF-A**)
    - `Authors`: Nicolas Huin; Brigitte Jaumard; Frédéric Giroire
    - `Keywords`: Placement
    - `Objective`: Placement cost -
    - `Link`: IEEE Xplore
48. **Deploying Chains of Virtual Network Functions: On the Relation Between Link and Server Usage**
    - `Publication`: TON 2018 (**CCF-A**)

- `Authors`: Tung-Wei Kuo; Bang-Heng Liou; Kate Ching-Ju Lin; Ming-Jer Tsai
- `Keywords`: Placement
- `Objective`: Placement cost -
- `Link`: IEEE Xplore

49. **Efficiently Embedding Service Function Chains with Dynamic Virtual Network Function Placement in Geo-Distributed Cloud System**
    - `Publication`: TPDS 2018 (**CCF-A**)
    - `Authors`: Jianing Pei; Peilin Hong; Kaiping Xue; Defang Li
    - `Keywords`: Deployment, Distributed, Binary Integer Programming (BIP)
    - `Objective`: Acceptance rate +, Placement cost -
    - `Link`: IEEE Xplore
50. **Virtual Network Function Placement Considering Resource Optimization and SFC Requests in Cloud Datacenter**
    - `Publication`: TPDS 2018 (**CCF-A**)
    - `Authors`: Defang Li; Peilin Hong; Kaiping Xue; jianing Pei
    - `Keywords`: Deployment, Data Center
    - `Objective`: Acceptance rate +, Placement cost -
    - `Link`: IEEE Xplore
51. **LVRM: On the Design of Efficient Link Based Virtual Resource Management Algorithm for Cloud Platforms**
    - `Publication`: TPDS 2018 (**CCF-A**)
    - `Authors`: Prasan Kumar Sahoo; Chinmaya Kumar Dehury; Bharadwaj Veeravalli
    - `Keywords`: Deployment, Cloud
    - `Objective`: Acceptance rate +, Placement cost -
    - `Link`: IEEE Xplore
52. **Virtual Network Function Deployment in Tree-Structured Networks**
    - `Publication`: ICNP 2018 (**CCF-B**)
    - `Authors`: Yang Chen; Jie Wu; Bo Ji
    - `Keywords`: Deployment, Tree Topology
    - `Objective`: Acceptance rate +, Placement cost -
    - `Link`: IEEE Xplore
53. **Rethinking Virtual Network Embedding in Reconfigurable Networks**
    - `Publication`: SECON 2018 (**CCF-B**)
    - `Authors`: Max Curran; Md. Shaifur Rahman; Himanshu Gupta; Vyas Sekar
    - `Keywords`: Placement
    - `Objective`: Placement cost -
    - `Link`: IEEE Xplore
54. **Automated Function Placement and Online Optimization of Network Functions Virtualization**
    - `Publication`: TCOM 2018 (**CCF-B**)
    - `Authors`: Xiaojing Chen; Wei Ni; Iain B. Collings; Xin Wang; Shugong Xu
    - `Keywords`: Deployment, Latency
    - `Objective`: Placement cost -, Latency -

- `Link`: IEEE Xplore

1. **Distributed Virtual Network Embedding System With Historical Archives and Set-Based Particle Swarm Optimization**
   - `Publication`: TSMC 2018 (**JCR-Q1**)
   - `Authors`: An Song; Wei-Neng Chen; Tianlong Gu; Huaqiang Yuan; Sam Kwong; Jun Zhang
   - `Keywords`: Deployment, Distributed, Particle Swarm Optimization (PSO)
   - `Objective`: Acceptance rate +
   - `Link`: IEEE Xplore
2. **Distributed Service Function Chaining**
   - `Publication`: JSAC 2017 (**CCF-A**)
   - `Authors`: Milad Ghaznavi; Nashid Shahriar; Shahin Kamali; Reaz Ahmed; Raouf Boutaba
   - `Keywords`: Deployment, Distributed
   - `Objective`: Acceptance rate +, Cost -
   - `Link`: IEEE Xplore
3. **Mobility Aware Virtual Network Embedding**
   - `Publication`: TMC 2017 (**CCF-A**)
   - `Authors`: Giorgos Chochlidakis; Vasilis Friderikos
   - `Keywords`: Deployment, Mobility, Distributed
   - `Objective`: Acceptance rate +, Mobility +
   - `Link`: IEEE Xplore
4. **Congestion-Aware Embedding of Heterogeneous Bandwidth Virtual Data Centers With Hose Model Abstraction**
   - `Publication`: TON 2017 (**CCF-A**)
   - `Authors`: Fangfang Yan; Tony T. Lee; Weisheng Hu
   - `Keywords`: Deployment, Congestion
   - `Objective`: Placement cost -, Congestion -
   - `Link`: IEEE Xplore
5. **Online Allocation of Virtual Machines in a Distributed Cloud**
   - `Publication`: TON 2017 (**CCF-A**)
   - `Authors`: Fang Hao; Murali Kodialam; T. V. Lakshman; Sarit Mukherjee
   - `Keywords`: Deployment, Distributed
   - `Objective`: Placement cost -
   - `Link`: IEEE Xplore
6. **An Approach for Service Function Chain Routing and Virtual Function Network Instance Migration in Network Function Virtualization Architectures**
   - `Publication`: TON 2017 (**CCF-A**)
   - `Authors`: Vincenzo Eramo; Emanuele Miucci; Mostafa Ammar; Francesco Giacinto Lavacca
   - `Keywords`: Deployment, Scheduling, Joint, energy
   - `Objective`: Acceptance rate +, Energy consumption -
   - `Link`: IEEE Xplore
7. **Optimizing Virtual Backup Allocation for Middleboxess**

- `Publication`: TON 2017 (**CCF-A**)
- `Authors`: Yossi Kanizo; Ori Rottenstreich; Itai Segall; Jose Yallouz
- `Keywords`: Deployment, Backup
- `Objective`: Placement cost -
- `Link`: IEEE Xplore

8. **Reliable Virtual Machine Placement and Routing in Clouds**
   - `Publication`: TPDS 2017 (**CCF-A**)
   - `Authors`: Song Yang; Philipp Wieder; Ramin Yahyapour; Stojan Trajanovski; Xiaoming Fu
   - `Keywords`: Deployment, Routing, Cloud, Latency
   - `Objective`: Placement cost -, Latency -
   - `Link`: IEEE Xplore
9. **Multi-resource Load Balancing for Virtual Network Functions**
   - `Publication`: ICDCS 2017 (**CCF-B**)
   - `Authors`: Tao Wang; Hong Xu; Fangming Liu
   - `Keywords`: Deployment, Load Balancing, Multi-resource
   - `Objective`: Load Balancing +
   - `Link`: IEEE Xplore
10. **Joint Optimization of Chain Placement and Request Scheduling for Network Function Virtualization**
    - `Publication`: ICDCS 2017 (**CCF-B**)
    - `Authors`: Qixia Zhang; Yikai Xiao; Fangming Liu; John C.S. Lui; Jian Guo; Tao Wang
    - `Keywords`: Deployment, Scheduling, Joint
    - `Objective`: Acceptance rate +, Latency -
    - `Link`: IEEE Xplore
11. **SLA-NFV: an SLA-aware High Performance Framework for Network Function Virtualization**
    - `Publication`: SIGCOMM 2016 (**CCF-A**)
    - `Authors`: Chen Sun, Jun Bi, Zhilong Zheng, Hongxin Hu
    - `Keywords`: Deployment, Latency
    - `Objective`: Latency +
    - `Link`: ACM DL
12. **Deploying chains of virtual network functions: On the relation between link and server usage**
    - `Publication`: INFOCOM 2016 (**CCF-A**)
    - `Authors`: Tung-Wei Kuo; Bang-Heng Liou; Kate Ching-Ju Lin; Ming-Jer Tsai
    - `Keywords`: Placement
    - `Objective`: Acceptance rate +
    - `Link`: IEEE Xplore
13. **Optimizing Virtual Backup Allocation for Middleboxess**
    - `Publication`: TON 2017 (**CCF-A**)
    - `Authors`: Yossi Kanizo; Ori Rottenstreich; Itai Segall; Jose Yallouz
    - `Keywords`: Deployment, Backup
    - `Objective`: Placement cost -

- `Link`: IEEE Xplore

14. **Application of evolutionary mechanism to dynamic Virtual Network Function Placement**
    - `Publication`: ICNP 2016 (**CCF-B**)
    - `Authors`: Mari Otokura; Kenji Leibnitz; Yuki Koizumi; Daichi Kominami; Tetsuya Shimokawa; Masayuki Murata
    - `Keywords`: Placement, Dynamic, Genetic algorithm
    - `Objective`: Cost -
    - `Link`: IEEE Xplore
15. **Optimizing virtual backup allocation for middleboxes**
    - `Publication`: ICNP 2016 (**CCF-B**)
    - `Authors`: Yossi Kanizo; Ori Rottenstreich; Itai Segall; Jose Yallouz
    - `Keywords`: Placement, Backup, Reliablity
    - `Objective`: Reliablity +
    - `Link`: IEEE Xplore
16. **Toward Profit-Seeking Virtual Network Embedding**
    - `Publication`: INFOCOM 2014 (**CCF-A**)
    - `Authors`: Long Gong, Yonggang Wen, Zuqing Zhu and Tony Lee
    - `Keywords`: Deployment, GRC (Global Resource Control)
    - `Objective`: Acceptance rate +, Revenue-to-cost ratio +
    - `Link`: IEEE Xplore
17. **Carlo Fuerst; Maciek Pacut; Paolo Costa; Stefan Schmid**
    - `Publication`: ICNP 2015 (**CCF-B**)
    - `Authors`: Carlo Fuerst; Maciek Pacut; Paolo Costa; Stefan Schmid
    - `Keywords`: Placement
    - `Objective`: Cost -
    - `Link`: IEEE Xplore
18. **A Multi-objective Ant Colony System algorithm for Virtual Machine Placement in Cloud Computing**
    - `Publication`: JCSS 2013 (**CCF-B**)
    - `Authors`: Panpan Jin; Xincai Fei; Qixia Zhang; Fangming Liu; Bo Li
    - `Keywords`: Deployment, ACS (Ant Colony System), Multi-objective
    - `Objective`: Placement cost -, Energy consumption -
    - `Link`: IEEE Xplore
19. **Joint VM placement and routing for data center traffic engineering**
    - `Publication`: INFOCOM 2012 (**CCF-A**)
    - `Authors`: Joe Wenjie Jiang; Tian Lan; Sangtae Ha; Minghua Chen; Mung Chiang
    - `Keywords`: Deployment, Routing, Joint, Markov approximation
    - `Objective`: Placement cost -
    - `Link`: IEEE Xplore
20. **Virtual Network Embedding through Topology Awareness and Optimization**
    - `Publication`: CN 2012 (**CCF-B**)
    - `Authors`: Xiang Cheng, Sen Su, Zhongbao Zhang, Kai Shuang, Fangchun Yang, Yan Luo, Jie Wang

- `Keywords`: Deployment, PSO (Particle Swarm Optimization), Topology decomposition
- `Objective`: Placement cost -, Energy consumption -
- `Link`: IEEE Xplore

3.4 Scheduling

1. **Service Placement and Request Scheduling for Data-Intensive Applications in Edge Clouds**
   - `Publication`: TON 2021 (**CCF-A**)
   - `Authors`: Vajiheh Farhadi; Fidan Mehmeti; Ting He; Thomas F. La Porta; Hana Khamfroush; Shiqiang Wang; Kevin S. Chan; Konstantinos Poularakis
   - `Keywords`: Joint, Deployment, Scheduling, Mobile Edge Computing
   - `Objective`: Cost -
   - `Link`: IEEE Xplore
2. **Highly-Efficient Switch Migration for Controller Load Balancing in Elastic Optical Inter-Datacenter Networks**
   - `Publication`: JSAC 2021 (**CCF-A**)
   - `Authors`: Yong Liu; Huaxi Gu; Fulong Yan; Nicola Calabretta
   - `Keywords`: Scheduling, Migration, Data Center
   - `Objective`: Cost -
   - `Link`: IEEE Xplore
3. **Joint Resource Optimization and Delay-aware Virtual Network Function Migration in Data Center Networks**
   - `Publication`: TNSM 2021 (**JCR-Q1**)
   - `Authors`: Biyi Li; Bo Cheng; Xuan Liu; Meng Wang; Yi Yue; Junliang Chen
   - `Keywords`: Scheduling, Migration, Latency
   - `Objective`: Placement cost -, Latency -
   - `Link`: IEEE Xplore
4. **HASFC: A MANO-Compliant Framework for Availability Management of Service Chains**
   - `Publication`: IEEE Communications Magazine 2021 (**JCR-Q1**)
   - `Authors`: Mario Di Mauro; Giovanni Galatro; Maurizio Longo; Fabio Postiglione; Marco Tambasco
   - `Keywords`: Scheduling, Deployment, Reliabilty
   - `Objective`: Cost -, Reliabilty +
   - `Link`: IEEE Xplore
5. **An Efficient Algorithm for Service Function Chains Reconfiguration in Mobile Edge Cloud Networks**
   - `Publication`: ICWS 2021 (**CCF-B**)
   - `Authors`: Biyi Li; Bo Cheng; Junliang Chen
   - `Keywords`: Scheduling, Migration, Dynamic Programmingbased
   - `Objective`: Placement cost -, Latency -
   - `Link`: IEEE Xplore

▶ more

1. **A seamless virtualized network functions migration mechanism in mobile edge networks**
   - `Publication`: MobiCom 2020 (**CCF-A**)
   - `Authors`: Biyi Li, Bo Cheng, Yi Yue, Meng Wang, Junliang Chen

- `Keywords`: Migration
- `Objective`: Cost -, Latency -
- `Link`: IEEE Xplore

2. **An Online Algorithm for VNF Service Chain Scaling in Datacenters**
   - `Publication`: TON 2020 (**CCF-A**)
   - `Authors`: Ziyue Luo; Chuan Wu
   - `Keywords`: Scheduling, Scaling
   - `Objective`: Deployment cost -
   - `Link`: IEEE Xplore
3. **On Parallel and Hitless vSDN Reconfiguration**
   - `Publication`: TON 2020 (**CCF-A**)
   - `Authors`: Sicheng Zhao, Xing Wu, Zuqing Zhu
   - `Keywords`: Reconfiguration
   - `Objective`: Parallelism +
   - `Link`: ACM DL
4. **NFVnice: Dynamic Backpressure and Scheduling for NFV Service Chains**
   - `Publication`: TON 2020 (**CCF-A**)
   - `Authors`: Sameer G. Kulkarni; Wei Zhang; Jinho Hwang; Shriram Rajagopalan; K. K. Ramakrishnan; Timothy Wood; Mayutan Arumaithurai; Xiaoming Fu
   - `Keywords`: Scheduling
   - `Objective`: Energy Consumption -
   - `Link`: IEEE Xplore
5. **A Multi-Stage Approach for Virtual Network Function Migration and Service Function Chain Reconfiguration in NFV-enabled Networks**
   - `Publication`: ICWS 2020 (**CCF-B**)
   - `Authors`: Biyi Li; Bo Cheng; Junliang Chen
   - `Keywords`: Scheduling, Migration
   - `Objective`: Latency -, Load balancing +
   - `Link`: IEEE Xplore
6. **Finedge: A Dynamic Cost-Efficient Edge Resource Management Platform for NFV Network**
   - `Publication`: ICWS 2020 (**CCF-B**)
   - `Authors`: Miao Li; Qixia Zhang; Fangming Liu
   - `Keywords`: Scheduling
   - `Objective`: QoS +
   - `Link`: IEEE Xplore
7. **Dynamic Cloud Network Control Under Reconfiguration Delay and Cost**
   - `Publication`: TON 2019 (**CCF-A**)
   - `Authors`: Chang-Heng Wang; Jaime Llorca; Antonia M. Tulino; Tara Javidi
   - `Keywords`: Scheduling, Reconfiguration, Latency
   - `Objective`: Latency -, Cost -
   - `Link`: IEEE Xplore

8. **Dynamic Network Function Instance Scaling Based on Traffic Forecasting and VNF Placement in Operator Data Centers**
    - `Publication`: TPDS 2019 (**CCF-A**)
    - `Authors`: Hong Tang; Danny Zhou; Duan Chen
    - `Keywords`: Scheduling, Deployment, Scaling, Traffic Forecasting, Data Center
    - `Objective`: Cost -
    - `Link`: IEEE Xplore
9. **Network Virtualization with Energy Efficiency Optimization for Wireless Heterogeneous Networks**
    - `Publication`: TMC 2019 (**CCF-A**)
    - `Authors`: Tai Manh Ho; Nguyen H. Tran; Long Bao Le; Zhu Han; S.M Ahsan Kazmi; Choong Seon Hong
    - `Keywords`: Scheduling, Migration, Heterogeneous
    - `Objective`: Revenue of InP +
    - `Link`: IEEE Xplore
10. **A multi-criteria decision approach for minimizing the influence of VNF migration**
    - `Publication`: CN 2019 (**CCF-B**)
    - `Authors`: Bo Yi, X. Wang, Min Huang, Anwei Dong
    - `Keywords`: Scheduling, Migration
    - `Objective`: Influence -
    - `Link`: ScienceDirect
11. **Network Function Virtualization in Dynamic Networks: A Stochastic Perspective**
    - `Publication`: JSAC 2018 (**CCF-A**)
    - `Authors`: Xiangle Cheng; Yulei Wu; Geyong Min; Albert Y. Zomaya
    - `Keywords`: Deployment, Dynamic
    - `Objective`: /
    - `Link`: IEEE Xplore
12. **Energy-Aware Virtual Machine Scheduling on Data Centers with Heterogeneous Bandwidths**
    - `Publication`: TPDS 2018 (**CCF-A**)
    - `Authors`: Daniel Guimaraes Lago; Edmundo R. M. Madeira; Deep Medhi
    - `Keywords`: Scheduling, Energy, Heterogeneous
    - `Objective`: Energy consumption -
    - `Link`: IEEE Xplore
13. **TerrierTail: Mitigating Tail Latency of Cloud Virtual Machines**
    - `Publication`: TON 2017 (**CCF-A**)
    - `Authors`: Esmail Asyabi; SeyedAlireza SanaeeKohroudi; Mohsen Sharifi; Azer Bestavros
    - `Keywords`: Scheduling, Latency
    - `Objective`: Latency -
    - `Link`: IEEE Xplore
14. **Traffic-Aware Virtual Machine Migration in Topology-Adaptive DCN**
    - `Publication`: TON 2017 (**CCF-A**)
    - `Authors`: Yong Cui; Zhenjie Yang; Shihan Xiao; Xin Wang; Shenghui Yan

- `Keywords`: Scheduling, Migration
- `Objective`: Thoughtout +, cost -
- `Link`: IEEE Xplore

15. **Mobile Edge Cloud Network Design Optimization**
    - `Publication`: TON 2017 (**CCF-A**)
    - `Authors`: Alberto Ceselli; Marco Premoli; Stefano Secc
    - `Keywords`: Scheduling
    - `Objective`: Cost -
    - `Link`: IEEE Xplore
16. **Cluster-Aware Virtual Machine Collaborative Migration in Media Cloud**
    - `Publication`: TPDS 2017 (**CCF-A**)
    - `Authors`: Lingfang Zeng; Yang Wang; Xiaopeng Fan; Chengzhong Xu
    - `Keywords`: Scheduling
    - `Objective`: Latency -
    - `Link`: IEEE Xplore
17. **Cluster-Aware Virtual Machine Collaborative Migration in Media Cloud**
    - `Publication`: TPDS 2017 (**CCF-A**)
    - `Authors`: Weizhan Zhang; Yuxuan Chen; Xiang Gao; Zhichao Mo; Qinghua Zheng; Zongqing Lu
    - `Keywords`: Scheduling, Migration
    - `Objective`: Cost -
    - `Link`: IEEE Xplore
18. **OpenBox: A Software-Defined Framework for Developing, Deploying, and Managing Network Functions**
    - `Publication`: TPDS 2017 (**CCF-A**)
    - `Authors`: Weizhan Zhang; Yuxuan Chen; Xiang Gao; Zhichao Mo; Qinghua Zheng; Zongqing Lu
    - `Keywords`: Chaining, Deployment, Scheduling, Migration, Joint
    - `Objective`: Framework
    - `Link`: ACM DL
19. **Cache contention aware Virtual Machine placement and migration in cloud datacenters**
    - `Publication`: ICNP 2016 (**CCF-B**)
    - `Authors`: Yossi Kanizo; Ori Rottenstreich; Itai Segall; Jose Yallouz
    - `Keywords`: Scheduling, Migration, Cache
    - `Objective`: Throughput +
    - `Link`: IEEE Xplore
20. **Transparent flow migration for NFV**
    - `Publication`: ICNP 2016 (**CCF-B**)
    - `Authors`: Yang Wang; Gaogang Xie; Zhenyu Li; Peng He; Kavé Salamatian
    - `Keywords`: Scheduling, Migration
    - `Objective`: Throughput +
    - `Link`: IEEE Xplore
21. **SliM: Enabling efficient, seamless NFV state migration**

- `Publication`: ICNP 2016 (**CCF-B**)
- `Authors`: Leonhard Nobach; Ivica Rimac; Volker Hilt; David Hausheer
- `Keywords`: Scheduling, Migration
- `Objective`: Cost -
- `Link`: IEEE Xplore

3.5 Routing

1. **SAFE-ME: Scalable and Flexible Policy Enforcement in Middlebox Networks**
   - `Publication`: TON 2022 (**CCF-A**)
   - `Authors`: Hongli Xu; Peng Xi; Gongming Zhao; Jianchun Liu; Chen Qian; Liusheng Huang
   - `Keywords`: Routing, Middlebox
   - `Objective`: Latency -, Scalability +
   - `Link`: IEEE Xplore
2. **Real-Time Update of Joint SFC and Routing in Software Defined Networks**
   - `Publication`: TON 2021 (**CCF-A**)
   - `Authors`: Xingpeng Fan; Hongli Xu; He Huang; Xuwei Yang
   - `Keywords`: Routing, Joint, Latency
   - `Objective`: Latency -
   - `Link`: IEEE Xplore
3. **Software-defined Internet of Multimedia Things: Energy-efficient and Load-balanced Resource Management**
   - `Publication`: IoTJ 2021 (**JCR-1**)
   - `Authors`: Jianhang Tang; Jiangtian Nie; Zehui Xiong; Jun Zhao; Yang Zhang; Dusit Niyato
   - `Keywords`: Routing, IoT, Energy, Load Balancing
   - `Objective`: Energy consumption -, Load Balancing +
   - `Link`: IEEE Xplore
4. **Congestion Minimization for Service Chain Routing Problems With Path Length Considerations**
   - `Publication`: TON 2021 (**CCF-A**)
   - `Authors`: Lingnan Gao; George N. Rouskas
   - `Keywords`: Routing
   - `Objective`: Congestion -
   - `Link`: IEEE Xplore

▶ more

1. **Congestion Minimization for Service Chain Routing Problems With Path Length Considerations**
   - `Publication`: TON 2020 (**CCF-A**)
   - `Authors`: Lingnan Gao; George N. Rouskas
   - `Keywords`: Routing, Congestion
   - `Objective`: Congestion -
   - `Link`: IEEE Xplore
2. **Throughput Maximization of NFV-Enabled Multicasting in Mobile Edge Cloud Networks**
   - `Publication`: TPDS 2020 (**CCF-A**)

- `Authors`: Yu Ma; Weifa Liang; Jie Wu; Zichuan Xu
- `Keywords`: Routing, Edge, Energy, Multicasting
- `Objective`: /
- `Link`: IEEE Xplore

3. **Throughput-Optimal Broadcast in Wireless Networks with Dynamic Topology**
   - `Publication`: TMC 2020 (**CCF-A**)
   - `Authors`: Abhishek Sinha; Leandros Tassiulas; Eytan Modiano
   - `Keywords`: Routing, Dynamic
   - `Objective`: Throughput +
   - `Link`: IEEE Xplore
4. **On SDN-Driven Network Optimization and QoS Aware Routing Using Multiple Paths**
   - `Publication`: TWC 2020 (**CCF-B**)
   - `Authors`: Miloud Bagaa; Diego Leonel Cadette Dutra; Tarik Taleb; Konstantinos Samdanis
   - `Keywords`: Routing
   - `Objective`: Throughput +
   - `Link`: IEEE Xplore
5. **Shortest Path and Maximum Flow Problems Under Service Function Chaining Constraints**
   - `Publication`: INFOCOM 2018 (**CCF-A**)
   - `Authors`: Gamal Sallam, Gagan R. Gupta, Bin Li, and Bo Ji
   - `Keywords`: Routing, Constrained
   - `Objective`: Running time -
   - `Link`: paper
6. **Central Control Over Distributed Routing**
   - `Publication`: SIGCOMM 2015 (**CCF-A**)
   - `Authors`: Stefano Vissicchio, Olivier Tilmans, Laurent Vanbever, Jennifer Rexford
   - `Keywords`: Routing, Distributed
   - `Objective`: Overhead -, Failure -
   - `Link`: ACM DL

4. Machine Learning-based Methods

> This is an interesting and promising research direction, looking forward to your participation!

4.1 Slicing

1. **A Constrained Reinforcement Learning Based Approach for Network Slicing**
   - `Publication`: ICNP 2020 (**CCF-B**)
   - `Authors`: Yongshuai Liu; Jiaxin Ding; Xin Liu
   - `Keywords`: Slicing
   - `Objective`: /

- `Link`: IEEE Xplore

4.2 Chaining

1. **Endogenous Trusted DRL-Based Service Function Chain Orchestration for IoT**
   - `Publication`: TC 2022 (**CCF-A**)
   - `Authors`: Shaoyong Guo; Yuanyuan Qi; Yi Jin; Wenjing Li; Xuesong Qiu; Luoming Meng
   - `Keywords`: Chaining, A3C (Asynchronous Advantage Actor-Critic)
   - `Objective`: Orchestration cost -
   - `Link`: IEEE Xplore
2. **Space-Air-Ground Integrated Multi-Domain Network Resource Orchestration Based on Virtual Network Architecture: A DRL Method**
   - `Publication`: TITS 2021 (**CCF-B**)
   - `Authors`: Peiying Zhang; Chao Wang; Neeraj Kumar; Lei Liu
   - `Keywords`: Chaining, Deployment, Multi-Domain, DQN
   - `Objective`: Placement cost -
   - `Link`: IEEE Xplore
3. **Scalable Orchestration of Service Function Chains in NFV-Enabled Networks: A Federated Reinforcement Learning Approach**
   - `Publication`: JSAC 2021 (**CCF-A**)
   - `Authors`: Haojun Huang, Cheng Zeng, Yangmin Zhao, Geyong Min, Yingying Zhu, Wang Miao , and Jia Hu
   - `Keywords`: Chaining, Deployment, DQN, FL (Federated Learning)
   - `Objective`: Placement cost -
   - `Link`: IEEE Xplore

4.3 Deployment

1. **Multiagent Deep Reinforcement Learning for Cost- and Delay-Sensitive Virtual Network Function Placement and Routing**
   - `Publication`: TPDS 2021 (**CCF-A**)
   - `Authors`: Shaoyang Wang; Chau Yuen; Wei Ni; Yong Liang Guan; Tiejun Lvi
   - `Keywords`: Deployment, Multiagent Deep Reinforcement Learning, deep deterministic policy gradient
   - `Objective`: Cost -, Latency -
   - `Link`: IEEE Xplore
2. **Monkey Business: Reinforcement learning meets neighborhood search for Virtual Network Embedding**
   - `Publication`: CN 2022 (**CCF-B**)
   - `Authors`: Maxime Elkael; Massinissa Ait Aba; Andrea Araldo; Hind Castel; Badii Jouaber
   - `Keywords`: Deployment, MCTS (Monte Carlo tree search), Neighborhood Search
   - `Objective`: Cost -, Revenue-to-cost +
   - `Link`: arXiv, code
3. **On the Effective Parallelization and Near-Optimal Deployment of Service Function Chains**
   - `Publication`: TPDS 2021 (**CCF-A**)

- `Authors`: Jianzhen Luo; Jun Li; Lei Jiao; Jun Cai
- `Keywords`: Deployment, Parallelization, Viterbi Dynamic Programming algorithm
- `Objective`: Latency -
- `Link`: IEEE Xplore

4. **Dynamic Virtual Network Embedding Algorithm based on Graph Convolution Neural Network and Reinforcement Learning**
   - `Publication`: IoTJ 2021 (**JCR-Q1**)
   - `Authors`: Peiying Zhang; Chao Wang; Neeraj Kumar; Weishan Zhang; Lei Liu
   - `Keywords`: Deployment, GNN, GCN, MDP (Markov Decision Process), Viterbi algorithm
   - `Objective`: Placement cost -
   - `Link`: IEEE Xplore
5. **VNE-HRL: A Proactive Virtual Network Embedding Algorithm Based on Hierarchical Reinforcement Learning**
   - `Publication`: TNSM 2021 (**JCR-Q1**)
   - `Authors`: Jin Cheng; Yulei Wu; Yeming Lin; Yuepeng E; Fan Tang; Jingguo Ge
   - `Keywords`: VNE, Hierarchical RL
   - `Objective`: Long-term revenue +
   - `Link`: IEEE Xplore
6. **A-DDPG: Attention Mechanism-based Deep Reinforcement Learning for NFV**
   - `Publication`: IWQoS 2021 (**CCF-B**)
   - `Authors`: Nan He, S. Yang, Fan Li, S. Trajanovski, F.A. Kuipers, Xiaoming Fu
   - `Keywords`: Deployment, Attention, DDPG, Latency
   - `Objective`: Placement cost -, Latency -
   - `Link`: paper
7. **A Heuristically Assisted Deep Reinforcement Learning Approach for Network Slice Placement**
   - `Publication`: TNSM 2020 (**JCR-Q1**)
   - `Authors`: Jose Jurandir Alves Esteves, Amina Boubendir, Fabrice Guillemin, Pierre Sens
   - `Keywords`: Deployment, A3C, GCN
   - `Objective`: Acceptance rate +
   - `Link`: arXiv
8. **Automatic Virtual Network Embedding: A Deep Reinforcement Learning Approach With Graph Convolutional Networks**
   - `Publication`: JSAC 2020 (**CCF-A**)
   - `Authors`: Zhongxia Yan, Jingguo Ge, Yulei Wu, Liangxiong Li, Tong Li
   - `Keywords`: Deployment, A3C (Asynchronous Advantage Actor-Critic), GNN, GCN (Graph Convolutional Network)
   - `Objective`: Acceptance rate +, Long-term average revenue +
   - `Link`: IEEE Xplore
9. **MUVINE: Multi-Stage Virtual Network Embedding in Cloud Data Centers Using Reinforcement Learning-Based Predictions**
   - `Publication`: JSAC 2020 (**CCF-A**)
   - `Authors`: Hiren Kumar Thakkar, Chinmaya Dehury, Prasan Kumar Sahoo

- `Keywords`: Deployment, Q-learning, ML(Machine Learning), Multi-Stage
- `Objective`: Long-term average revenue +, Placement cost -
- `Link`: paper

10. **Virtual Network Function Placement Optimization With Deep Reinforcement Learning**
    - `Publication`: JSAC 2020 (**CCF-A**)
    - `Authors`: Ruben Solozabal; Josu Ceberio; Aitor Sanchoyerto; Luis Zabala; Bego Blanco; Fidel Liberal
    - `Keywords`: Deployment, PG (Policy Gradients), Attention, LSTM
    - `Objective`: Acceptance rate +, Power consumption -
    - `Link`: IEEE Xplore
11. **Optimal VNF Placement via Deep Reinforcement Learning in SDN/NFV-Enabled Networks**
    - `Publication`: JSAC 2020 (**CCF-A**)
    - `Authors`: Jianing Pei, Peilin Hong, Miao Pan, Jiangqing Liu, Jingsong Zhou
    - `Keywords`: Deployment, DDQN (Double Deep Q Network), BIP (Binary Integer Programming)
    - `Objective`: Acceptance rate +, Placement cost -
    - `Link`: IEEE Xplore
12. **A Dynamic Reliability-Aware Service Placement for Network Function Virtualization (NFV)**
    - `Publication`: JSAC 2020 (**CCF-A**)
    - `Authors`: Zhongxia Yan, Jingguo Ge, Yulei Wu, Liangxiong Li, Tong Li
    - `Keywords`: Deployment, Dynamic Reliability-aware, MDP (Markov Decision Process), Viterbi algorithm
    - `Objective`: Acceptance rate +, Placement cost -
    - `Link`: arXiv
13. **Dynamic Service Function Chain Embedding for NFV-Enabled IoT: A Deep Reinforcement Learning Approach**
    - `Publication`: TWC 2020 (**CCF-B**)
    - `Authors`: Xiaoyuan Fu; F. Richard Yu; Jingyu Wang; Qi Qi; Jianxin Liao
    - `Keywords`: Deployment, Latency, DQN, Dynamic
    - `Objective`: Acceptance rate +, Placement cost -
    - `Link`: IEEE Xplore
14. **A Dynamic and Collaborative Multi-Layer Virtual Network Embedding Algorithm in SDN Based on Reinforcement Learning**
    - `Publication`: TNSM 2020 (**JCR-Q1**)
    - `Authors`: Mohammad Karimzadeh-Farshbafan; Vahid Shah-Mansouri; Dusit Niyato
    - `Keywords`: Deployment, Collaborative, Multi-Layer, REINFORCE
    - `Objective`: Acceptance rate +, Long-term average revenue +
    - `Link`: IEEE Xplore
15. **DDQP: A Double Deep Q-Learning Approach to Online Fault-Tolerant SFC Placement**
    - `Publication`: TNSM 2020 (**JCR-Q1**)
    - `Authors`: Lei Wang; Weixi Mao; Jin Zhao; Yuedong Xu
    - `Keywords`: Deployment, DDQN
    - `Objective`: Acceptance rate +, Placement cost -
    - `Link`: IEEE Xplore

16. **A Continuous-Decision Virtual Network Embedding Scheme Relying on Reinforcement Learning**
    - `Publication`: TNSM 2020 (**JCR-Q1**)
    - `Authors`: Haipeng Yao; Sihan Ma; Jingjing Wang; Peiying Zhang; Chunxiao Jiang; Song Guo
    - `Keywords`: Continuous-Decision, Time Series, RNN, Seq2Seq
    - `Objective`: Long term average revenue to cost ratio +
    - `Link`: IEEE Xplore
17. **A Privacy-Preserving Reinforcement Learning Algorithm for Multi-Domain Virtual Network Embedding**
    - `Publication`: TNSM 2020 (**JCR-Q1**)
    - `Authors`: Davide Andreoletti, Tanya Velichkova, Giacomo Verticale, Massimo Tornatore , Silvia Giordano
    - `Keywords`: Deployment, Multi-domain, Privacy
    - `Objective`: /
    - `Link`: IEEE Xplore
18. **Multi-domain Non-cooperative VNF-FG Embedding: A Deep Reinforcement Learning Approach**
    - `Publication`: INFOCOM 2019 (**CCF-A**)
    - `Authors`: Pham Tran Anh Quang, Abbas Bradai, Kamal Deep Singh, Yassine Hadjadj-Aoul
    - `Keywords`: Deployment, DDPG (Deep Deterministic Policy Gradient), Multi-domain, Non-cooperative
    - `Link`: paper
19. **DeepViNE: Virtual Network Embedding with Deep Reinforcement Learning**
    - `Publication`: INFOCOM 2019 (**CCF-A**)
    - `Authors`: Mahdi Dolati, Seyedeh Bahereh Hassanpour, Majid Ghaderi, Ahmad Khonsari
    - `Keywords`: Deployment, DQN (Deep Q Network), Multi-channels Representations
    - `Objective`: Acceptance rate +
    - `Link`: paper
20. **Virtual Network Function Placement Optimization with Deep Reinforcement Learning**
    - `Publication`: JSAC 2019 (**CCF-A**)
    - `Authors`: Ruben Solozabal, Josu Ceberio, Aitor Sanchoyerto, Luis Zabala, Bego Blanco, Fidel Liberal
    - `Keywords`: Deployment, PG (Policy Gradient), Seq2Seq (Sequence-to-Sequence)
    - `Objective`: Energy consumption -
    - `Link`: IEEE Xplore
21. **Deep Reinforcement Learning Based VNF Management in Geo-distributed Edge Computing**
    - `Publication`: ICDCS 2019 (**CCF-B**)
    - `Authors`: Lin Gu; Deze Zeng; Wei Li; Song Guo; Albert Zomaya; Hai Jin
    - `Keywords`: Deployment, DDPG, Latency
    - `Objective`: Acceptance rate +, Placement cost -
    - `Link`: IEEE Xplore
22. **NFVdeep: adaptive online service function chain deployment with deep reinforcement learning**
    - `Publication`: IWQoS 2019 (**CCF-B**)
    - `Authors`: Yikai Xiao, Qixia Zhang, Fangming Liu, Jia Wang, Miao Zhao, Zhongxing Zhang, Jiaxing Zhang
    - `Keywords`: Deployment, PG (Policy Gradient), Serialization and Backtracking, Time Slots
    - `Objective`: Energy consumption -, Acceptance rate +

- `Link`: paper

23. **VNE-TD: A virtual network embedding algorithm based on temporal-difference learning**
    - `Publication`: CN 2019 (**CCF-B**)
    - `Authors`: Sen Wang, Jun Bi, Jianping Wu, Athanasios V. Vasilakos, Qilin Fan
    - `Keywords`: Deployment, TD (Temporal Difference), GRC (Global Resource Control)
    - `Objective`: Long-term time-average revenue +
    - `Link`: ScienceDirect
24. **NeuroViNE: A Neural Preprocessor for Your Virtual Network Embedding Algorithm**
    - `Publication`: INFOCOM 2018 (**CCF-A**)
    - `Authors`: Andreas Blenk; Patrick Kalmbach; Johannes Zerwas; Michael Jarschel; Stefan Schmid; Wolfgang Kellerer
    - `Keywords`: Deployment, Hopfield Network
    - `Objective`: Revenue-cost ratio +, Running time -
    - `Link`: IEEE Xplore
25. **Virtual Network Embedding via Monte Carlo Tree Search**
    - `Publication`: IEEE Trans on Cybernetics 2018 (**CCF-B**)
    - `Authors`: Soroush Haeri and Ljiljana Trajkovi´c
    - `Keywords`: Deployment, MCTS (Monte Carlo Tree Search)
    - `Objective`: Revenue-to-cost +, Acceptance rate +
    - `Link`: paper
26. **Knowledge-Defined Networking**
    - `Publication`: CCNC 2017
    - `Authors`: Oussama Soualah, Marouen Mechtri, Chaima Ghribi, Djamal Zeghlache
    - `Keywords`: Deployment, MCTS (Monte Carlo Tree Search)
    - `Objective`: Acceptance rate +
    - `Link`: paper
27. **An Efficient Algorithm for Virtual Network Function Placement and Chaining**
    - `Publication`: ACM SIGCOMM Computer Communication Review 2017
    - `Authors`: Albert Mestres et al.
    - `Keywords`: Placement an so on
    - `Objective`: /
    - `Link`: paper
28. **MDP and Machine Learning-Based Cost-Optimization of Dynamic Resource Allocation for Network Function Virtualization**
    - `Publication`: SCC 2015
    - `Authors`: Runyu Shi; Jia Zhang; Wenjing Chu; Qihao Bao; Xiatao Jin; Chenran Gong; Qihao Zhu; Chang Yu; Steven Rosenberg
    - `Keywords`: Deployment, MDP, Bayesian learning
    - `Objective`: Acceptance rate +
    - `Link`: IEEE Xplore

4.4 Scheduling

1. **Reliability-aware Dynamic Service Chain Scheduling in 5G Networks based on Reinforcement Learning**
   - `Publication`: INFOCOM 2021 (**CCF-A**)
   - `Authors`: Junzhong Jia; Lei Yang; Jiannong Cao
   - `Keywords`: Scheduling, MIIP, Reliability, Redundancy, A3C, TextCNN
     - `Objective`: Decide the redundancy of the Scheduling while minimizing delay
   - `Link`: IEEE Xplore
2. **Towards Chain-Aware Scaling Detection in NFV with Reinforcement Learning**
   - `Publication`: IWQOS 2021 (**CCF-B**)
   - `Authors`: Lin He; Lis han Li; Ying Liu
   - `Keywords`: Scaling ,A3C
   - `Objective`: Cost -
   - `Link`: IEEE Xplore
3. **Management and Orchestration of Virtual Network Functions via Deep Reinforcement Learning**
   - `Publication`: JSAC 2020 (**CCF-A**)
   - `Authors`: Joan S. Pujol Roig; David M. Gutierrez-Estevez; Deniz Gündüz
   - `Keywords`: Scheduling, Chaining, Actor-Critic
   - `Objective`: Cost -, QoS +
   - `Link`: IEEE Xplore
4. **Intelligent VNF Orchestration and Flow Scheduling via Model-Assisted Deep Reinforcement Learning**
   - `Publication`: JSAC 2020 (**CCF-A**)
   - `Authors`: Lin Gu, Deze Zeng, Wei Li, Song Guo, Albert Y. Zomaya, Hai Jin
   - `Keywords`: Scheduling, Latency-awareness, flow, DDPG (Deep Deterministic Policy Gradient)
   - `Objective`: Maximize the overall network utility with the consideration of end-to-end delay and various cost
   - `Link`: IEEE Xplore
5. **Virtual Network Functions Migration Cost: from Identification to Prediction**
   - `Publication`: CN 2020 (**CCF-B**)
   - `Authors`: Rafael de JesusMartins, Cristiano Bonato Both, Juliano Araújo Wickboldt, Lisandro Zambenedett iGranville
   - `Keywords`: Scheduling, SL, Linear regression
   - `Objective`: A novel architecture for orchestrating and enforcing multi-domain SFCs
   - `Link`: ScienceDirect
6. **Deep Reinforcement Learning based VNF Management in Geo-distributed Edge Computing**
   - `Publication`: ICDCS 2019 (**CCF-B**)
   - `Authors`: Lin Gu, Deze Zeng, Wei Li, Song Guo, Albert Y. Zomaya, Hai Jin
   - `Keywords`: Scheduling, Latency-awareness, flow, DDPG (Deep Deterministic Policy Gradient)
   - `Objective`: Latency -, Placement cost -
   - `Link`: IEEE Xplore
7. **Study of Reconfiguration Cost and Energy Aware VNE Policies in Cycle-Stationary Traffic Scenarios**
   - `Publication`: JASC 2016 (**CCF-A**)

- `Authors`: Tung-Wei Kuo; Bang-Heng Liou; Kate Ching-Ju Lin; Ming-Jer Tsai
- `Keywords`: Deployment, Reconfiguration, Joint, Energy, Cycle-Stationary Traffic, MDP
- `Objective`: Placement cost -
- `Link`: IEEE Xplore

4.5 Routing

1. **DRL-OR: Deep Reinforcement Learning-based Online Routing for Multi-type Service Requirements**
   - `Publication`: INFOCOM 2021 (**CCF-A**)
   - `Authors`: Chenyi Liu; Mingwei Xu; Yuan Yang; Nan Geng
   - `Keywords`: Scheduling, Latency, Multi-agent, PPO
   - `Link`: IEEE Xplore
2. **Towards Real-Time Routing Optimization with Deep Reinforcement Learning: Open Challenges**
   - `Publication`: INFOCOM 2021 (**CCF-A**)
   - `Authors`: Paul Almasan, José Suárez-Varela, Bo Wu, Shihan Xiao, Pere Barlet-Ros, Albert Cabellos-Aparicio
   - `Keywords`: RL, GNN, PPO
   - `Link`: arXiv
3. **A Multi-agent Reinforcement Learning Perspective on Distributed Traffic Engineering**
   - `Publication`: ICNP 2020 (**CCF-B**)
   - `Authors`: Nan Geng; Tian Lan; Vaneet Aggarwal; Yuan Yang; Mingwei Xu
   - `Keywords`: Scheduling, Multi-agent, Traffic Engineering
   - `Link`: IEEE Xplore
4. **Unveiling the potential of Graph Neural Networks for network modeling and optimization in SDN**
   - `Publication`: SOSR 2019
   - `Authors`: Krzysztof Rusek, José Suárez-Varela, Albert Mestres, Pere Barlet-Ros, Albert Cabellos-Aparicio
   - `Keywords`: Routing, SL (Surpervised Learning), GNN
   - `Link`: arXiv
5. **Routing or Computing? The Paradigm Shift Towards Intelligent Computer Network Packet Transmission Based on Deep Learning**
   - `Publication`: TC 2019 (**CCF-A**)
   - `Authors`: Bomin Mao; Zubair Md. Fadlullah; Fengxiao Tang; Nei Kato; Osamu Akashi; Takeru Inoue; Kimihiro Mizutani
   - `Keywords`: Routing, SL (Surpervised Learning)
   - `Link`: IEEE Xplore
6. **Learning to Route**
   - `Publication`: HotNets 2017
   - `Authors`: Asaf Valadarsky, Michael Schapira, Dafna Shahaf, Aviv Tamar
   - `Keywords`: Route, RL
   - `Objective`: Automatically generate "good" routing configurations
   - `Link`: paper

5. Other and Unclassified

> Here are two types of papers: one is related to other topics of NFV and SDN and waiting to be classified; the other is the latest research work collected from arXiv.

1. **SDNShield: NFV-Based Defense Framework Against DDoS Attacks on SDN Control Plane**
   - `Publication`: TON 2022 (**CCF-A**)
   - `Authors`: Kuan-Yin Chen; Sen Liu; Yang Xu; Ishant Kumar Siddhrau; Siyu Zhou; Zehua Guo; H. Jonathan Chao
   - `Keywords`: Attack
   - `Link`: IEEE Xplore
2. **Performance Tuning via Lean Measurements for Acceleration of Network Functions Virtualization**
   - `Publication`: TON 2022 (**CCF-A**) (Early Access)
   - `Authors`: Qiang Wu; Xiangping Bryce Zhai; Xi Liu; Chun-Ming Wu; Fangliang Lou; Hongke Zhang
   - `Keywords`: Acceleration
   - `Link`: IEEE Xplore
3. **Near Optimal Learning-Driven Mechanisms for Stable NFV Markets in Multitier Cloud Networks**
   - `Publication`: TON 2022 (**CCF-A**)
   - `Authors`: Zichuan Xu; Haozhe Ren; Weifa Liang; Qiufen Xia; Wanlei Zhou; Pan Zhou; Wenzheng Xu; Guowei Wu; Mingchu Li
   - `Keywords`: Market
   - `Link`: IEEE Xplore
4. **KPI Guarantees in Network Slicing**
   - `Publication`: TON 2021 (**CCF-A**) (Early Access)
   - `Authors`: Jorge Martín-Pérez; Francesco Malandrino; Carla Fabiana Chiasserini; Milan Groshev; Carlos J. Bernardos
   - `Keywords`: Performance
   - `Link`: IEEE Xplore
5. **Dynamic Network Security Function Enforcement via Joint Flow and Function Scheduling**
   - `Publication`: TIFS 2022 (**CCF-A**)
   - `Authors`: Qi Li; Xinhao Deng; Zhuotao Liu; Yuan Yang; Xiaoyue Zou; Qian Wang; Mingwei Xu; Jianping Wu
   - `Keywords`: Security
   - `Link`: IEEE Xplore
6. **The Greatest Teacher, Failure is: Using Reinforcement Learning for SFC Placement Based on Availability and Energy Consumption**
   - `Authors`: Guto Leoni Santos, Theo Lynn, Judith Kelner, Patricia Takako Endo
   - `Link`: arXiv
7. **Learning based E2E Energy Efficient in Joint Radio and NFV Resource Allocation for 5G and Beyond Networks**
   - `Authors`: Narges Gholipoor, Ali Nouruzi, Shima Salarhosseini, Mohammad Reza Javan, Nader Mokari, Eduard A. Jorswieck
   - `Link`: arXiv
8. **When SRv6 meets 5G Core: Implementation and Deployment of a Network Service Chaining Function in SmartNICs**

- `Authors`: Guilherme Matos, Fabio Luciano Verdi, Luis Miguel Contreras, Leandro C. de Almeida
- `Link`: arXiv

9. **End-to-End Delay Guaranteed SFC Deployment: A Multi-level Mapping Approach**
   - `Authors`: Fatemeh Yaghoubpour, Bahador Bakhshi, Fateme Seifi
   - `Link`: arXiv
10. **Service Function Chaining in MEC: A Mean-Field Game and Reinforcement Learning Approach**
    - `Authors`: Amine Abouaomar, Soumaya Cherkaoui, Zoubeir Mlika, Abdellatif Kobbane
    - `Link`: arXiv
11. **Automated SmartNIC Offloading Insights for Network Functions**
    - `Publication`: SOSP 2021 (**CCF-A**)
    - `Authors`: Yiming Qiu, Jiarong Xing, Kuo-Feng Hsu, Qiao Kang, Ming Liu, Srinivas Narayana, Ang Chen
    - `Keywords`: Offloading
    - `Link`: ACM DL
12. **Bento: safely bringing network function virtualization to Tor**
    - `Publication`: SIGCOMM 2021 (**CCF-A**)
    - `Authors`: Michael Reininger, Arushi Arora, Stephen Herwig, Nicholas Francino, Jayson Hurst, Christina Garman, Dave Levin
    - `Keywords`: Programmable
    - `Link`: ACM DL
13. **vSFC: Generic and Agile Verification of Service Function Chains in the Cloud**
    - `Publication`: TON 2021 (**CCF-A**)
    - `Authors`: Xiaoli Zhang; Qi Li; Zeyu Zhang; Jianping Wu; Jiahai Yang
    - `Keywords`: Verification
    - `Link`: IEEE Xplore
14. **Performance Modeling of Softwarized Network Services Based on Queuing Theory With Experimental Validation**
    - `Publication`: TMC 2021 (**CCF-A**)
    - `Authors`: Jonathan Prados-Garzon; Pablo Ameigeiras; Juan J. Ramos-Munoz; Jorge Navarro-Ortiz; Pilar Andres-Maldonado; Juan M. Lopez-Soler
    - `Keywords`: Performance
    - `Link`: IEEE Xplore
15. **Leveraging Network Functions Virtualization Orchestrators to Achieve Software-Defined Access Control in the Clouds**
    - `Publication`: TDSC 2021 (**CCF-A**)
    - `Authors`: Montida Pattaranantakul; Ruan He; Zonghua Zhang; Ahmed Meddahi; Ping Wang
    - `Keywords`: Security
    - `Link`: IEEE Xplore
16. **Contention-Aware Performance Prediction For Virtualized Network Functions**
    - `Publication`: SIGCOMM 2020 (**CCF-A**)
    - `Authors`: Antonis Manousis, Rahul Anand Sharma, Vyas Sekar, Justine Sherry
    - `Keywords`: Performance

- `Link`: ACM DL

17. **Fault Tolerant Service Function Chaining**
    - `Publication`: SIGCOMM 2020 (**CCF-A**)
    - `Authors`: Milad Ghaznavi, Elaheh Jalalpour, Bernard Wong, Raouf Boutaba, Ali José Mashtizadeh
    - `Keywords`: Fault-tolerant
    - `Link`: ACM DL
18. **Looking Glass of NFV: Inferring the Structure and State of NFV Network From External Observations**
    - `Publication`: TON 2020 (**CCF-A**)
    - `Authors`: Yilei Lin; Ting He; Shiqiang Wang; Kevin Chan; Stephen Pasteris
    - `Keywords`: Framework
    - `Link`: IEEE Xplore
19. **Adding Support for Automatic Enforcement of Security Policies in NFV Networks**
    - `Publication`: TON 2019 (**CCF-A**)
    - `Authors`: Cataldo Basile; Fulvio Valenza; Antonio Lioy; Diego R. Lopez; Antonio Pastor Perales
    - `Keywords`: Security
    - `Link`: IEEE Xplore
20. **Automated synthesis of adversarial workloads for network functions**
    - `Publication`: SIGCOMM 2018 (**CCF-A**)
    - `Authors`: Luis Pedrosa, Rishabh Iyer, Arseniy Zaostrovnykh, Jonas Fietz, Katerina Argyraki
    - `Keywords`: Adversarial workloads
    - `Link`: ACM DL
21. **Design, Implementation and Verification of Cloud Architecture for Monitoring a Virtual Machine's Security Health**
    - `Publication`: TC 2018 (**CCF-A**)
    - `Authors`: Tianwei Zhang; Ruby B. Lee
    - `Keywords`: Security
    - `Link`: IEEE Xplore

Contributing

😃Favorably receive that submit relevant papers to this repository in the appropriate format:

```
# Exemples

## A template of the survey / analysis

1. **Recent Advances of Resource Allocation in Network Function Virtualization**

- `Publication`: TPDS 2021 (**CCF-A**)
- `Authors`: Song Yang, Fan Li, Stojan Trajanovski, Ramin Yahyapour, Xiaoming Fu
- `Link`: [IEEE Xplore](https://ieeexplore.ieee.org/document/9169857)

## A template of the research paper
```

```
1. **An Online Algorithm for VNF Service Chain Scaling in Datacenters**

- `Publication`: TON 2020 (**CCF-A**)
- `Authors`: Ziyue Luo, Chuan Wu
- `Keywords`: Scheduling, Deployment, ILP (Integer Linear Program), Regularization,
Rounding
- `Objective`: Minimize the operating cost and deployment cost
- `Link`: [paper](https://i.cs.hku.hk/~cwu/papers/zyluo-ton19.pdf)
```

Recommend

There are some repositories which probably help you to comprehend or research this topic:

- Virne: Python framework for VNE
- GNN-Communication-Networks
- The Internet Topology Zoo: Real Network Topology Dataset
- SNDlib: Survivable Network Design Library
- awesome-rl (Awesome Reinforcement Learning)
- awesome-ml4co (Awesome Machine Learning for Combinatorial Optimization Resources)